

Report
OF THE OPERATIONS OF THE
Engineer Department
OF THE DISTRICT OF COLUMBIA

FOR THE YEAR ENDED

JUNE 30

1922

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UNDER THE DIRECTION OF

COL. CHARLES KELLER

Corps of Engineers, United States Army
Engineer Commissioner, District of Columbia

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ORGANIZATION OF THE ENGINEER DEPARTMENT, DISTRICT OF COLUMBIA.

Colonel CHARLES KELLER, *Corps of Engineers, United States Army, Engineer Commissioner.*
Major F. S. BESSON, *Corps of Engineers, United States Army, Assistant.*
Major CAREY H. BROWN, *Corps of Engineers, United States Army, Assistant.*
Captain JOHN E. WOOD, *Corps of Engineers, United States Army, Assistant.*

UNDER THE IMMEDIATE SUPERVISION OF THE ENGINEER COMMISSIONER.

RECORD DIVISION:

ROLAND M. BRENNAN, *Chief Clerk.*

WHARF COMMITTEE:

ROLAND M. BRENNAN, *Chief Clerk, Engineer Department.*

D. E. MCCOMB, *Engineer of Bridges.*

RUSSEL DEAN, *Harbor Master.*

DISTRICT BUILDING:

Major F. S. BESSON, *Superintendent.*

UNDER THE IMMEDIATE SUPERVISION OF MAJOR BESSON.

HIGHWAYS (STREETS, ROADS, BRIDGES, ETC.):

C. B. HUNT, *Engineer of Highways.*

J. W. DARE, *Assistant Engineer of Highways.*

Sidewalks and alleys—

H. N. MOSS, *Superintendent of Streets.*

Construction and maintenance of suburban roads—

L. R. GRABILL, *Superintendent of Suburban Roads.*

Construction and care of bridges—

D. E. MCCOMB, *Engineer of Bridges.*

Engineer Department stables—

BART. J. LYNCH, *Superintendent.*

STREET AND ALLEY CLEANING, COLLECTION OF GARBAGE, ETC.:

MORRIS HACKER, *Supervisor of City Refuse.*

T. L. COSTIGAN, *Superintendent of Street Cleaning.*

ASPHALTS AND CEMENTS:

J. O. HARGROVE, *Inspector of Asphalt and Cements.*

TREES AND PARKINGS:

CLIFFORD LANHAM, *Superintendent of Trees and Parkings.*

MUNICIPAL GARAGE:

E. P. BROOKE, *In charge.*

CHARLES N. EMMONS, *Superintendent.*

UNDER THE IMMEDIATE SUPERVISION OF MAJOR BROWN.

MUNICIPAL ARCHITECT:

ALBERT L. HARRIS.

Repairs to municipal buildings—

HENRY STOREY, *Superintendent of Repairs.*

SURVEYOR'S OFFICE (INCLUDING STREET EXTENSIONS):

M. C. HAZEN, *Surveyor.*

BUILDING INSPECTION:

JOHN P. HEALY, *Inspector of Buildings.*

Plumbing plans and inspection—

A. R. MCGONEGAL, *Inspector of Plumbing.*

Permits, Engineer Department—

H. M. WOODWARD, *Permit Clerk.*

Plumbing board—

P. C. SCHAEFER.

J. S. O'HAGAN.

SAMUEL TAPP.

Board of examiners of steam engineers—

E. F. VERMILLION.

H. BOESCH.

W. I. EVANS.

BOARD FOR CONDEMNATION OF INSANITARY BUILDINGS:

Major CAREY H. BROWN, *Assistant to Engineer Commissioner.*

Dr. W. C. FOWLER, *Health Officer.*

JOHN P. HEALY, *Inspector of Buildings.*

UNDER THE IMMEDIATE SUPERVISION OF CAPTAIN WOOD.

WATER DEPARTMENT:

J. S. GARLAND, *Superintendent.*

Water rates—

G. W. WALLACE, *Water Registrar.*

SEWER CONSTRUCTION AND MAINTENANCE:

J. B. GORDON, *Sanitary Engineer.*

ELECTRICAL DEPARTMENT:

WARREN B. HADLEY, *Electrical Engineer.*

**EXTRACT FROM REPORT OF THE COMMISSIONERS OF THE
DISTRICT OF COLUMBIA FOR THE FISCAL YEAR ENDED
JUNE 30, 1922.**

**OFFICE OF THE COMMISSIONERS
OF THE DISTRICT OF COLUMBIA,
Washington, December 4, 1922.**

*To the Senate and House of Representatives of the United States of
America in Congress assembled:*

The Commissioners of the District of Columbia herewith submit for the information of Congress, pursuant to the requirements of section 12 of an act providing a permanent form of government for the District of Columbia, approved June 11, 1878 (20 U. S. Stats., 108), a report of the official doings of that government for the fiscal year ended June 30, 1922.

* * * * *

ROADWAY PAVEMENTS.

The accompanying table shows the area in square yards of new roadway pavements laid and old roadway pavements resurfaced during the year, with the totals in square yards and miles of the various kinds of pavements at the close of the fiscal year.

Comparative statement showing character and extent of roadway pavements.

	Existing amount on June 30, 1921.		New pavement laid dur- ing year, square yards.	Replaced with asphalt.	Existing amount on June 30, 1922.	
	Square yards.	Miles.			Square yards.	Miles.
Sheet asphalt and coal tar.....	3,377,623	179.98	44,774		3,422,397	182.21
Asphalt blocks.....	625,673	31.74		13,468	612,205	31.11
Durax block.....	17,968	.57			17,968	.57
Asphaltic or bituminous concrete:						
On concrete base.....	78,708	4.58			78,708	4.58
On broken stone base.....	51,088	2.68			51,088	2.68
Cement concrete.....	250,218	13.45	11,487		261,705	14.07
Granite block and rubble.....	357,596	19.59		406	357,190	19.54
Vitrified block.....	17,390	1.04			17,390	1.04
Cobble.....	37,056	1.56		682	36,374	1.52
Macadam (estimated).....	1,882,559	120.85	5,956	14,205	1,874,310	120.58
Gravel and unimproved (traveled).....		148.88				149.34
Gutters on asphalt streets.....	238,495		2,869		241,364	
Pavements maintained by street rail- ways.....	564,525				564,525	
Gutters on asphaltic concrete streets.....	11,201				11,201	
Total.....	7,510,100	524.92	65,086	28,761	7,546,425	527.24

NOTE.—31,503.15 square yards sheet asphalt and coal tar pavements replaced, including 14,269.76 square yards of asphalt surface on old base.

The sums appropriated for expenditures during the year under this head were as follows:

For repairing old roadway pavements, including asphalt resurfacing.....	\$642,500
For paving new roadways.....	144,840
For repair of suburban roads.....	250,000
For grading streets, alleys, and roads.....	35,000

The prices paid under contracts for roadway pavements during the year were as follows:

	Per square yard.
Laying sheet-asphalt pavement (2½-inch asphalt surface, 2-inch binder, before compression), with 6-inch concrete base.....	\$3.17
Laying vitrified block with 6-inch concrete base.....	3.27
Laying 6-inch concrete roadway.....	2.28

The prices paid for resurfacing and repairing asphalt pavements under one-year contracts which expired June 30, 1922, are as follows:

Laying sheet-asphalt pavement (2½-inch asphalt surface, 2-inch binder, before compression), with 6-inch concrete base, per square yard.....	\$3.17
Laying sheet-asphalt surface (2½ inches before compression), per square yard.....	1.17
Laying asphalt binder (in connection with resurfacing work), per cubic foot..	.53
Laying sheet-asphalt surface for repairs, etc., within the space required by law to be kept in repair by street railway companies, per cubic foot.....	.70
Laying asphalt binder for repairs, etc., within space required by law to be kept in repair by street railway companies, per cubic foot.....	.60

Unit costs of work continued high. A pronounced characteristic of our field of work was an unprecedented development of property by builders on many streets either newly dedicated or lacking any surface improvements. The duty of supplying such improvements thus placed upon us was beyond our means and opportunities and the results of our efforts to perform it were quite inadequate to the necessities and disappointing to the property owners and ourselves. As a partial provision against such a contingency in the future a fund for the paving of such roadways on the deposit of the half cost by the property owners was successfully recommended to Congress.

SUBURBAN STREETS AND ROADS.

There were no notable individual items of street improvements and the entire schedule was much the smallest of any within our experience. The continued high cost of maintenance and entirely unsatisfactory condition of our heavily traveled suburban roads emphasizes the necessity of their prompt improvement with sheet asphalt on a concrete base as the only adequate correction. Recommendations made in previous reports as to restrictive legislation limiting the weights of loaded vehicles are respectively renewed.

MUNICIPAL ASPHALT PLANT.

The District of Columbia has operated a portable municipal asphalt plant in the repair of asphalt pavements and bituminous macadam roadways for the past 11 years. During the year 1922 the plant was operated for a period of 245 days, with a total output of 209,352 cubic feet of material, or an average daily output of 854 cubic feet. Additional asphalt material for street repairs supplemental to that furnished by the asphalt plant was purchased under contract from the Cranford Paving Co. to the amount of 12,076 cubic feet.

The details of the cost of the operation of the plant are contained in the report of the engineer of highways.

SIDEWALKS AND ALLEYS.

The sum of \$285,000 was appropriated for paving sidewalks and alleys in all parts of the District and the sum of \$20,000 for laying sidewalks and setting curbs around Government buildings, reservations, and parks. Sidewalks are paved with cement concrete under contract, while alleys are paved with cement concrete by day labor forces.

One-half of the cost of curb, sidewalk, and alley pavement is assessed against the abutting property, except that abutting public buildings and public reservations. The contract price for laying sidewalks during the year was as follows:

For large jobs adjoining paved streets, per square yard.....	\$1.79
For large jobs adjoining unpaved streets and for small jobs, per square yard..	1.97

The initiative in the matter of paving sidewalks and alleys is generally left with the owners of the abutting property, the commissioners requiring a majority petition for such work before it is ordered. Exceptions are made, however, in cases where, on account of public danger or other public reasons, the paving is demanded. The law requires the commissioners to advertise for two weeks their intention to lay sidewalks and curbs and to pave alleys and to give a hearing to the property owners affected. The work is ordered subsequent to such hearing when, in the opinion of the commissioners, it is necessary for public health, safety, comfort, and convenience. The demand for this class of construction is constant, and increased appropriations for this work could be advantageously expended.

BRIDGES.

Construction of a concrete retaining wall on Canal Road west of the Aqueduct Bridge was completed under contract with the Warren F. Brenizer Co. at a cost of \$48,663.59, and also contract with the Miller & Dorsey Co., for driving and capping bearing piles and dredging at Wharf No. 6 was completed at a cost of \$11,486.82.

Contract for the construction of new roadway floor on the Calvert Street Bridge was entered into with Royal J. Mansfield at a cost of \$17,798.

Contract for the construction of reinforced concrete wharf decks at Wharf No. 6 was entered into with the Cambridge Manufacturing Co. at a cost of \$14,260.

Contract for construction of nine reinforced concrete stalls at the N Street trestle was entered into with the Allen H. Rogers Co. at a cost of \$9,643.50.

Contract for the construction of 12 concrete bins at the N Street trestle was entered into with Royal J. Mansfield at a cost of \$14,984.

INSPECTION OF ASPHALTS AND CEMENTS.

Chemical and physical tests of materials entering into street and road improvements, such as asphalts, hydraulic cements, sands, road oils, etc., also fuel oils used at the municipal asphalt plant and cements used in sewer and building constructions, are made in the office of the inspector of asphalts and cements. Complete tests representing many subdeterminations were made as follows: Asphalt materials,

1,189; oils, 5; pitch, 1; sands, 92; cements 8,222, representing 82,243 barrels; gravel, 107; stone, 86; miscellaneous materials, 604 total, 10,306.

The samples of asphalt tested represent 2,215 tons which were used by contractors laying sheet asphalt and 521 tons which were used in the production of paving materials at the municipal asphalt plant. Of the materials tested, 3,110 cubic yards of sand were rejected.

SURVEYOR'S OFFICE.

The work of this office is divided into three classes: (1) Work for private parties, for which a fee is charged; (2) work for various departments of the District of Columbia and Federal Government, for which no fee is charged; and (3) survey, preparation, and report for all condemnation cases for streets, alleys, and parks.

SURVEYS FOR WHICH A FEE IS CHARGED (SURVEYS FOR PRIVATE PARTIES).

This work has greatly increased over any previous year. The orders for work in 1920 were 5,795; 1921, 8,450; while in 1922 they were 11,320, or an average of about 36 orders per day. This great increase is also shown by the cash receipts, which were \$40,503.80 the past fiscal year, as compared to \$25,355.82 for the fiscal year ended June 30, 1921.

This places more work upon the office than it has been able to do promptly and efficiently with the present force, and, as the work is performed for the public, prompt service is demanded.

A table has been submitted showing in detail the amount of work of all kinds for the past two fiscal years for purpose of comparison. This shows the number of surveys for private parties for 1921 was 1,645 and 2,227 for 1922. The number of resurveys, or surveys to examine walls of houses being erected, was 1,084 for 1921 and 1,700 for 1922; the number of subdivisions made, 228 for 1921 and 532 for 1922; subdivisions recorded, 212 for 1921 and 470 for 1922. The total of surveys for both the District of Columbia and private parties was 3,124 for 1921 and 4,135 for 1922, and the total of plats of all kinds drawn by this office was 8,204 for 1921 and 12,100 for 1922.

CONDEMNATION OF STREETS, ALLEYS, AND SMALL PARKS.

Forty-six condemnation cases were before the courts during the past fiscal year, divided into 26 street and building restriction line cases, 8 park cases, and 12 alley cases. The total amount awarded as damages for the cases confirmed was \$127,641.94 for streets, parks, etc., and \$7,715.42 for the condemnation of alleys.

Some of the important cases now in court are (1) the opening of all streets in Barry Farm; (2) the opening of Webster, Allison, and Buchanan Streets and Arkansas Avenue; (3) the opening of Western Avenue between Massachusetts Avenue and Wisconsin Avenue; and (4) the widening of Southern Avenue between Bonini and Livingston Roads.

All plats and descriptions in the matter of condemnation of streets in Barry Farm have been completed by this office. This is probably the largest individual case for the opening of streets that this office has ever submitted for condemnation.

Other large projects being prepared by the office are the proposed widening of Canal Street from Thirty-sixth and M Streets, Georgetown, to the Conduit Road; the widening of Broad Branch Road from the District line to Rock Creek Park; and the widening of Benning Road from Anacostia Avenue (Benning) to the District line. These projects are very desirable to provide better facilities for traffic before improvements are constructed which will make the cost of condemnation prohibitive.

PARKS.

The plan of the original city of Washington provided for a comprehensive street plan and beautiful parks. A comprehensive street plan outside of the original city was adopted by Congress in 1893, but no provision was made for a park plan. If subdivisions continue to be made of the land outside of the original city limits, much beautiful and desirable land suitable for parks will be lost for that purpose. There is nothing which will promote the health and happiness of the people of the city more than outdoor recreation and playgrounds, and the new Washington, being created beyond Florida Avenue, will not have the benefit of these park areas unless some provision is made before the land is subdivided and improved.

The office has from time to time recommended the acquisition of Piney Branch parkway, Klinge Road valley, and the Patterson tract for parks. They are beautifully situated and mostly covered with magnificent trees, and are ideal for park purposes. Improvements are being made so rapidly which are encroaching upon Piney Branch parkway and Klinge Valley park that if some action is not taken at once they will be lost as parks.

There is no link in the chain of parks in the District so important as the Klinge Road valley. This is covered with most beautiful trees, and will connect Potomac Park and the Mall on the south with Rock Creek Park on the north without passing through Zoological Park. If this link is acquired it will complete the park system from the south end of Potomac Park to the north end of Rock Creek Park, which is the north end of the District, making one of the most beautiful chains of parks in any city of the country.

The enactment of legislation to acquire the Civil War forts and a fort drive connecting the same is a matter that should be considered. There are some 40 forts and batteries in the District which formed the defenses of Washington. Some have been destroyed by improvements, while many still remain. Their acquisition would be of historic interest and a fort drive connecting them would constitute a beautiful boulevard, which would connect all parts of the District.

TREES AND PARKINGS.

The number of trees planted along the curbs in the streets of the District of Columbia at the close of the fiscal year was 105,889, an increase over the preceding year of 86.

Nearly all of the trees planted were for the purpose of filling vacancies in existing rows in the northwest and southwest sections of the city.

The nursery at Fort Dupont is still being used for the propagation of trees for street planting. There is not enough ground available in the tract to grow the total number of trees necessary to keep pace

with the rapid growth of the city. During the fiscal year 1,535 Norway maple, 542 red maple, 828 red oak, 1,393 pin oak, and 228 elm seedlings were planted in the nursery rows.

No systematic trimming was undertaken during the year, but to offset this the "floating gang" accomplished much trimming on individual requests. It is the intention to resume the systematic trimming of all the trees on the streets in the northwest section of the city, west of eighteenth Street and south of Florida Avenue in the near future. The total number of trees trimmed during the year was 8,796.

STREET AND ALLEY CLEANING AND COLLECTION AND DISPOSAL OF CITY REFUSE.

Eight hundred thousand dollars was appropriated for the collection and disposal of garbage, ashes, and miscellaneous refuse, and \$375,000 for dust prevention, cleaning of streets and alleys, and for snow removal. Because of the exceptionally heavy snowfall in the last days of January, necessitating extraordinary expenditure for its removal, an additional sum of \$30,000 was appropriated by Congress to cover this cost.

This snow clearly indicated that the equipment available for such work was entirely inadequate. To cover this deficiency, trucks, plows, and tractors have been purchased with which to keep the street open for travel in future snowfalls.

In street and alley cleaning work it is to be noted that the unit costs per 1,000 square yards have returned to about pre-war costs. An innovation this year was the use of motor driven sweepers. The cleaning was done in this way at a cost considerably less than by horse-drawn machines.

The amount of garbage collected was over 15 per cent greater than in the previous year. A total of 69,452 tons was collected at a cost of \$233,640.60. The disposal of this garbage cost \$154,799.62, but in reducing it there was produced grease which was sold for \$121,532.07. Besides this, tankage was made which may be sold when prices for this material are better, so that it is estimated the net cost of disposal of the city's garbage was only slightly over \$5,000.

Because of the cold winter, the quantity of ashes collected and disposed of was greater than usual, amounting to 156,100 cubic yards.

The cost of collection and disposal of miscellaneous refuse from householders was \$194,805.64, but there was salvaged and sold sundry material to the value of \$67,458.68, so that the net expense of this work was \$127,346.96.

Because of the many new houses being built, the amount of refuse to be collected has increased very materially. This condition requires added expenditure for this work as well as new equipment, repairs to plant, and added facilities not permitted by previous appropriations.

BUILDING OPERATIONS.

The estimated value of building construction, including repairs, during the year was \$36,197,059, an increase of \$17,197,133, as compared with the fiscal year 1921.

The number of permits issued was 10,301, an increase of 1,991 over the previous year. This is the greatest number of permits ever issued for any fiscal year by the building division. The total number of new buildings erected was 3,510, an increase of 1,905. There were 2,397 dwellings, an increase of 1,625; 60 apartment houses, an increase of 46; and 1,053 business buildings, an increase of 234. The number of permits issued to repair buildings was 5,664, an increase of 341.

This astonishing increase in the estimated value of building construction, notwithstanding it approximates the total valuation of building operations in some of the so-called banner years, will not prove abnormal as compared with building construction in the future so as far as a judgment may be based on the present and prospective activities in this respect. Since the close of the fiscal year there has been no diminution in the number of permits issued nor in the filing of plans for major operations.

The cost of materials and of labor continues much above the normal, yet the demand for both seems as insistent as at any time during the year.

The act to regulate the height, area, and use of buildings, commonly known as the zoning law, and the regulations promulgated thereunder, are generally received with favorable recognition and an apparent desire on the part of the public to conform therewith.

During the past year there were issued 3,002 conforming certificates of occupancy and 295 nonconforming certificates, the fees therefor totaling \$3,305.50 as compared with \$2,400 for the year 1921.

As this office is charged with the responsibility of administering the zoning law it is regrettable that the office has no clerks who may be assigned to this work. The present method is to transfer employees from other departments, two being engaged now, a third having been retired because the appropriation under which he was employed expired at the close of the fiscal year 1922 and was not renewed for the present fiscal year. Satisfactory administration urgently dictates an increase of the clerical force of this department by at least three men, in order that a force sufficient to cope with the administration might be assured the year round.

Attention is invited to the fact that the receipts of this bureau for the fiscal year were \$51,126, the salaries amounted to \$38,503, a difference of \$12,622. This increase of receipts above expenses indicates to a marked degree the additional labor imposed upon the employees, and should dictate, it is believed, a corresponding increase in salaries.

CONSTRUCTION OF MUNICIPAL BUILDINGS.

During the year 14 buildings operations were in progress, as follows:

The psychopathic group of buildings and power house and domestic buildings for the Gallinger Municipal Hospital; the remodeling of the Phelps School; a 4-room addition to the Monroe School; a 4-room addition to the Deanwood School; a 12-room addition to the Wheatley School; an 8-room addition to the John Eaton School; an 8-room addition to the Lucretia Mott School; the superstructure of the new

Eastern High School; an 8-room school building known as the Richard Kingsman School; an 8-room addition to the Buchanan School; an 8-room school building to replace the Bell School; and the south-eastern branch library. A part of the south shelter for the farmers' produce market was also in course of erection.

In addition to the preparation of plans and specifications for the above structures, plans and specifications for about 40 other items of work, such as heating systems for engine houses and school-buildings, cells and other work in police stations, etc., were prepared by this office, amounting to approximately \$61,489. Contracts entered into through this office amounted to a total of \$2,334,055.

REPAIRS TO MUNICIPAL BUILDINGS.

All municipal buildings are kept in repair under the direction of the municipal architect. During the year only such repairs were made as would prevent further deterioration of structures, as the continuance of high wages and high prices of materials prevented the prosecution of more extensive repair work with the limited funds available.

The appropriations for repair work and the expenditures of the same were as follows:

Repairs to school buildings: Two hundred and twenty-five thousand dollars was appropriated and all but \$167.16 expended. Twenty thousand dollars was appropriated for repairs to engine houses and grounds, and all was expended. Eight thousand dollars was appropriated for repairs to police stations and grounds, and all but \$23.41 was expended. Three thousand dollars was appropriated for repairs to the police court building, and all but \$47.43 was expended.

In addition to the above, repairs were made to various buildings under the control of the commissioners, to the amount of \$74,461.02.

Steam boilers in 89 municipal buildings were inspected and repaired.

WORKHOUSE AND REFORMATORY.

The work accomplished at the workhouse and reformatory during the past year has been quite satisfactory. Definite plans for the general scheme of buildings for the workhouse have been made and approved, and it is expected that these plans in detail will be completed during the current year and building operations begun on some of the buildings.

At the reformatory several of the shops have been completed as well as two disciplinary wards. Three dormitory buildings have been started, one of which is practically ready for the roof.

Plans are being developed for the enlargement of the power house.

THE DISTRICT BUILDING.

The routine work incident to the maintenance of the District Building involves several distinct functions, viz: The power plant; woodworking, paint, electrical, blue-print, photograph, and printing shops; and the elevator, watch, and cleaning forces. During the year 2,003 tons of coal were consumed, which coal ran 31.1 per cent ash as compared with 15.9 per cent last year.

Four hundred and forty-four thousand four hundred and thirty kilowatt hours of current was generated, of which 294,250 were used for lighting, 53,950 for elevators, and 96,330 for motors. Electric current used by the various departments for purposes other than lighting amounted to 43,713 kilowatt hours. The print shop completed 1,400,569 pieces of printed matter at a cost of \$6,639.02, while the blue-print and photograph shop completed 183,608 square feet of blueprinting and 2,550 photographs at a total cost of \$8,103.22. The price of blue printing was reduced from 4 to 3 cents per square foot. A dryer for the Pease blue-printing machine was purchased at a cost of \$600.

Because of the continued growth of old departments and the creation of new departments, additional floor space is needed and should be provided either by constructing an addition to the District Building or by acquiring adjacent property.

MUNICIPAL GARAGE.

During the fiscal year 44 automobiles were maintained and kept in running order. The garage was kept open day and night, all machines being washed and supplied with oil and gasoline by the night force. A laboring and mechanical force of eight men made the necessary repairs and operated automobiles for departments having no drivers. A battery charging outfit was installed. The total operating expenses for the maintenance of the automobiles referred to, including gas, oil, tires, and miscellaneous supplies, amounted to \$18,500.67 or an average of \$420.46 for each car, or \$0.0532 per mile. The average mileage per car was 5,417 miles.

PLUMBING INSPECTION.

During the year the plumbing inspection division made a total of 41,725 inspections, which included inspections of plumbing construction work in new buildings, plumbing repairs in old buildings, and visits of investigation following complaint of insanitary conditions. This is approximately the same number of inspections as was made last year, but by reason of the more extensive building in the suburbs it required more time on the part of the men. The records show that the average number of inspections per day per man was nearly 14. Practically one-third of all of the above inspections, as well as more than half of the clerical work in the office, was due to complaints of insanitary plumbing in old houses or defective sheet-metal rain leaders and gutters, this great number of complaints being undoubtedly due to the present housing situation in the District of Columbia.

During the year 39 warrants were sworn out in police court for violation of the plumbing regulations, of which but 2 cases were dismissed for lack of evidence. The fines collected amounted to \$385.

There were also 275 prosecutions under the nuisance and drainage acts, of which the plumbing division found it necessary to do the work in 45 cases and assess the cost.

PLUMBING BOARD.

There were 66 applicants for examination for license as master plumber and gas fitter, of whom 11 passed and were granted license, and there were at the end of the year 238 registered master plumbers, about 190 of whom were actively engaged in business.

PUBLIC-CONVENIENCE STATIONS.

The four convenience stations were operated throughout the year from 6 a. m. until midnight daily, including Sundays, and there were registered over 13,000,000 users. The cash receipts amounted to \$9,377.03.

INSPECTION OF STEAM BOILERS.

The number of steam boilers inspected by the inspector of steam boilers during the year was 470, including 36 belonging to the District of Columbia. Twelve boilers were condemned as unfit for further use. The compensation of the inspector of steam boilers is paid from fees collected from private owners of boilers. The total amount of fees reported by that official was \$2,350, and the expense of inspection \$370, leaving a net compensation to him of \$1,980.

EXAMINATION OF STEAM ENGINEERS.

The board of examiners of steam engineers held 54 meetings and examined 262 applicants, of whom 172 were found competent and 90 incompetent.

STREET LIGHTING.

There are 20,708 street lamps of all kinds in the avenues, streets, alleys, etc., under the jurisdiction of the Commissioners of the District of Columbia, as follows:

Gas, mantle:		
Single burner.....	10,617	
Double burner.....	117	
		10,734
Electric, arc:		
6.6-ampere magnetite.....	283	
4.0-ampere magnetite.....	500	
		783
Electric, incandescent:		
250-candlepower, series.....	89	
200-candlepower, multiple.....	64	
100-candlepower, series.....	4,060	
100-candlepower, multiple.....	98	
60-candlepower, series.....	4,021	
60-candlepower, multiple.....	274	
		8,606
Street designation:		
Gas, 2½-foot, flat flame.....	401	
Electric, 8-candlepower.....	184	
		585
Total.....		20,708

This was a net increase during the year of 366 lamps.

The additions and extensions, 157 gas, 209 electric, have been of a minor sort, to meet pressing demands and needs, mostly in streets newly built upon, the largest single installation being 17 lamps, and

82 per cent of the increase being widely scattered in lots of 5 or less. At some points especially indicated, congested intersections, car stops, etc., the size of lamps has been increased, but of the 603 lamps newly connected (gross), 337, or about 56 per cent, were either "designation" lamps or the lowest powered gas or electric.

A material improvement in effectiveness of lighting results from trial change of equipment to double burner inverted gas mantle, to the number of 117, at street intersections, with single inverted intermediate. Trial installations have also been made of lights for traffic guidance purposes to the number of 12 of several different types, all considered of value in traffic control.

Replacement of some of the gas lamps by electric and of some of the existing electric by larger and more effective units, to provide a higher degree of visibility, is necessary to safety, in view of modern traffic conditions.

The situation with respect to suits against certain railroad companies to recover for lighting streets, etc., adjacent to their rights of way, remains essentially as reported for the past two years, the necessary new trial in lower court not having been reached.

SIGNAL SYSTEMS—FIRE-ALARM TELEGRAPH, POLICE-PATROL SIGNAL, AND TELEPHONE SERVICE.

There were 739 fire-alarm boxes in service at the end of the year, 626 on underground and 113 on overhead wires, a net increase of 25 over the preceding year; 984 box fire alarms and 1,007 local alarms were received and transmitted during the year, of which 139 box and 42 local were false.

Additional apparatus at fire-alarm headquarters to increase the number of box circuits by 10, to 40, was installed and connected to the switchboard; the rearrangement of box circuits and increase in number to relieve overloading is in progress.

There were 487 police patrol boxes in service at the end of the year, 384 on underground and 103 on overhead wires, an increase of 12 over the preceding year.

There were 1,453 telephones connected to the District system at the end of the year, and 27 in use as portable sets by fire and electrical departments, an increase of 26 in the year.

The number of cells of storage battery in service on fire-alarm, police patrol, and local circuits remains unchanged at 2,174. The battery room has been enlarged and the battery rack extended to accommodate increase of battery about to be made.

There were in service on the composite signals system on June 30, 1922, 165.54 miles of underground cable, containing 6,460.04 miles of conductors, and 174.81 miles of aerial conductors, a grand total of 6,634.85 miles of conductors, a net increase of 85.85 miles of conductors. Reserve capacity of several of the cables is below requirement of demand and below safe emergency provision. Provision for expansion is again presented as an urgent requirement.

The use of radio communication for municipal functions has been recognized by the assignment of a band of wave lengths in the regulations being promoted by the Department of Commerce and the utilization of that new art by the District in the near future may be advantageous.

ELECTRICAL INSPECTION.

The total number of permits issued for installation of wires and apparatus for electric light, heat, and power purposes on private premises, not including distribution or other plants of public-service companies, during the year was 8,029, compared with 6,217 in the preceding year, representing approximately 8,822 kilowatts capacity of utilization equipment. The total amount of fees paid for permits for such installations was \$13,861, compared with \$11,626. The total number of inspections recorded, relating to this work, was 17,284 compared with 14,965. The annual increase of service to be rendered is marked and the service rendered has reached the saturation point; in fact adequate inspection with the number of inspectors engaged is not physically possible.

Supervision was exercised over the erection, taking down, and moving of an aggregate of 2,204 line and guy poles and 468 pole guy anchors, and of the stringing of overhead wires in streets and other public spaces. The total of recorded wire-supporting poles in the District at the end of the year was: Line, 19,690; guy, 1,224; total, 20,914, compared with a total of 20,002 at the end of the preceding year, a net increase of 912; representing an exceptional activity, due doubtless to the exceptional suburban development. The telephone company has increased by 1 the number of its poles in streets within the area prescribed in the act of Congress regulating the use of telephone wires approved June 30, 1902.

MISCELLANEOUS.

The electrical department has cooperated with the municipal architect and other District officers, consulting and counseling, preparing plans, specifications, and estimates, and supervising electrical work. This service has been somewhat exceptional in extent, due to the school building program.

HARBOR FRONT.

The annual rental of the wharves on the river front placed by law under the control of the commissioners as of June 30, 1922, follows:

Washington Channel.....	\$15,269.00
Anacostia Channel.....	400.00
Georgetown Channel.....	534.60

16,203.60

The actual water frontage of the District of Columbia devoted to commerce, with the exception of canals, is about 2 miles. The total available water front is 18 miles, of which about 8 miles is set aside for parks and for other purposes of the United States. The largest amount of wharf property under the control of the commissioners is along the Washington Channel.

The harbor police station and dock, the dock of the fire boat, the District morgue, the municipal fish wharves and market, and the

District workhouse and sand wharves are located along the Washington Channel between the south curb line of N Street and Thirteenth Street. The balance of the frontage is leased by steamboat companies boathouses, and other commercial interests.

The Board of Engineers of Rivers and Harbors has under consideration the matter of establishing a bulkhead along the Washington Channel with a view to providing ultimately maximum facilities for all legitimate water-front uses, both governmental and commercial.

CONDEMNATION OF INSANITARY BUILDINGS.

The board of condemnation of insanitary buildings held 18 meetings and issued orders for the demolition of 132 and the repair of 117 structures. Of the buildings condemned 84 were located on streets and 48 on alleys.

Since the creation of the board May 1, 1906, it has examined 8,421 buildings, of which 2,677 were demolished and 2,029 repaired. Of the buildings demolished 1,779 were located on streets and 898 on alleys.

The estimated value of repairs required by the board during the year ended June 30, 1922, is \$46,430.

Estimated value of repairs required by the board during the past four years \$214,620.

One hundred and thirty-four 20-day preliminary notices were served on owners to show cause why buildings should not be condemned.

Forty condemnation orders were served.

Forty-nine condemnation cards were affixed to buildings.

Sixty-nine condemnation orders were served under section 16 of the building code.

One thousand four hundred and fifty-nine inspections and miscellaneous visits were made.

Estimated number of people required to secure other living quarters, 528.

Number of cases in court, 1.

Estimated number of tenants and occupants of dilapidated and insanitary buildings benefited by repairs required by the board during the year ended June 30, 1922, 585.

Estimated number of tenants and occupants of insanitary and dilapidated buildings benefited by repairs since the creation of the board, 7,421.

SEWERAGE AND SEWAGE-DISPOSAL SYSTEMS.

The construction and maintenance of the sewerage system and the sewage-disposal system of the District of Columbia is placed under a division in charge of the sanitary engineer.

The length of main and pipe sewers constructed during the year was 10.09 miles. The total length of main and pipe sewers on June 30, 1922, was 763.97 miles, of which 152.31 miles are main sewers and 611.66 miles are pipe sewers. In addition to the above new sewer work, 83 storm-water catch basins were constructed during the year, bringing the total number to 6,302.

There was expended during the year on new extensions of the sewerage system the sum of \$310,717.60, and on the sewage-disposal system \$4,885.71. The total cost of the sewerage system to June 30, 1922, was \$15,412,515.28. The total cost of the sewage-disposal system to the same date was \$5,975,232.96, making a total cost of the complete system to June 30, 1922, of \$21,387,748.24.

The main sewerage pumping station and the three substations were in continuous operation throughout the year, handling the sewage of practically the entire district. In addition, the main station pumped storm water from the 900-acre low level area flanking Pennsylvania Avenue between the Peace Monument and Fifteenth Street. At the main station, sewage to the amount of 24,906,695,603 gallons and storm water to the amount of 2,319,731,496 gallons were pumped during the year. The Poplar Point substation pumped 821,735,317 gallons, the Rock Creek substation 125,879,731 gallons, and the Woodridge substation 15,293,400 gallons of sewage during the year. Eliminating the Rock Creek and Woodridge substations, which deliver their discharge to the main station, the above would indicate a mean daily pumpage of sewage of 70,438,852 gallons. The coal consumption at the main sewerage pumping station for the year amounted to 5,963 tons.

Pursuant to act of Congress approved September 1, 1916, to protect streams flowing through United States parks and reservations in the District of Columbia from pollution, and the act of the Maryland State Legislature approved April 10, 1918, the commissioners have prepared and submitted to the Washington suburban sanitary commission a working agreement to govern the conditions under which Maryland sewage may be diverted through the district sewers to the District sewerage pumping station. In advance of carrying out the terms of above agreement it will be necessary to extend, at an estimated cost of \$750,000, the three principal sewage interceptors to the District line.

Attention is called to the fact that the extension of the sewer system has been allowed to lag considerably behind the growth of the city and, due to the lack of storm-water sewers, the problem of handling surface water is becoming more and more difficult. Furthermore there is a decided need for relief sewers within the old city limits to prevent the recurrence of flooded premises due to the inadequacy in size of many of the older sewers.

Attention is also called to the fact that it was not possible to keep the extension of the sewer system abreast of the building activities during the year, which activities exceeded those of any previous year, and the fiscal year ended with service sewers, estimated to cost over \$120,000, authorized constructed for the service of new buildings but not built on account of lack of funds.

WATER MAINS.

During the year 61,862 feet or 11.7 miles of water mains were laid, making a total length of mains now in service 659.2 miles. There were also in service at the end of the year 11,362 valves of various sizes, 3,814 fire hydrants, 253 public hydrants, 21 sanitary fountains, 153 horse fountains, and 44 public wells.

The aggregate cost of the water mains in service June 30, 1922, paid from water department funds, was \$4,477,732.02.

WATER CONSUMPTION.

The mean daily consumption for the fiscal year was 63,309,230, being 1,802,400 gallons more than the mean daily consumption for 1921. Making a mean daily per capita consumption of 140.68 gallons—estimated on a population of 450,000.

The total pumpage for the year was 11,832,035,550 gallons.

The total coal burned was 7,333 tons.

The cost of operating pumps for the year was \$102,637.92 as against \$118,195.29 in 1921; thus making the cost of pumping 1,000,000 gallons of water into the mains \$8.74, as against \$10.40 for the preceding year.

Underground leakage found and stopped during the year amounted to 1,678,500 gallons daily. The largest quantity found since the year 1917.

WATER REVENUES AND EXPENDITURES.

The revenues from all sources, including a balance of \$161,344.46 in the Treasury, amounted to \$1,307,760.27.

Expenditures of the water department amounted to \$771,763.74; advances on account of the Washington Aqueduct \$224,921.47, leaving a balance of \$311,075.06, which is obligated to the amount of \$61,086.50, which leaves an unobligated balance of \$249,988.56. Of the total cost of work done during the year 34 per cent was expended for new work and 66 per cent for maintenance.

WATER METERS.

Two thousand and forty-three water meters were installed at an average cost of \$10.50 each.

The revenue collected for the year under the meter system was \$840,747.29; under the flat-rate, \$97,458.52; for building purposes, \$4,976.64.

Sixty-four thousand five hundred and forty-five services are now metered.

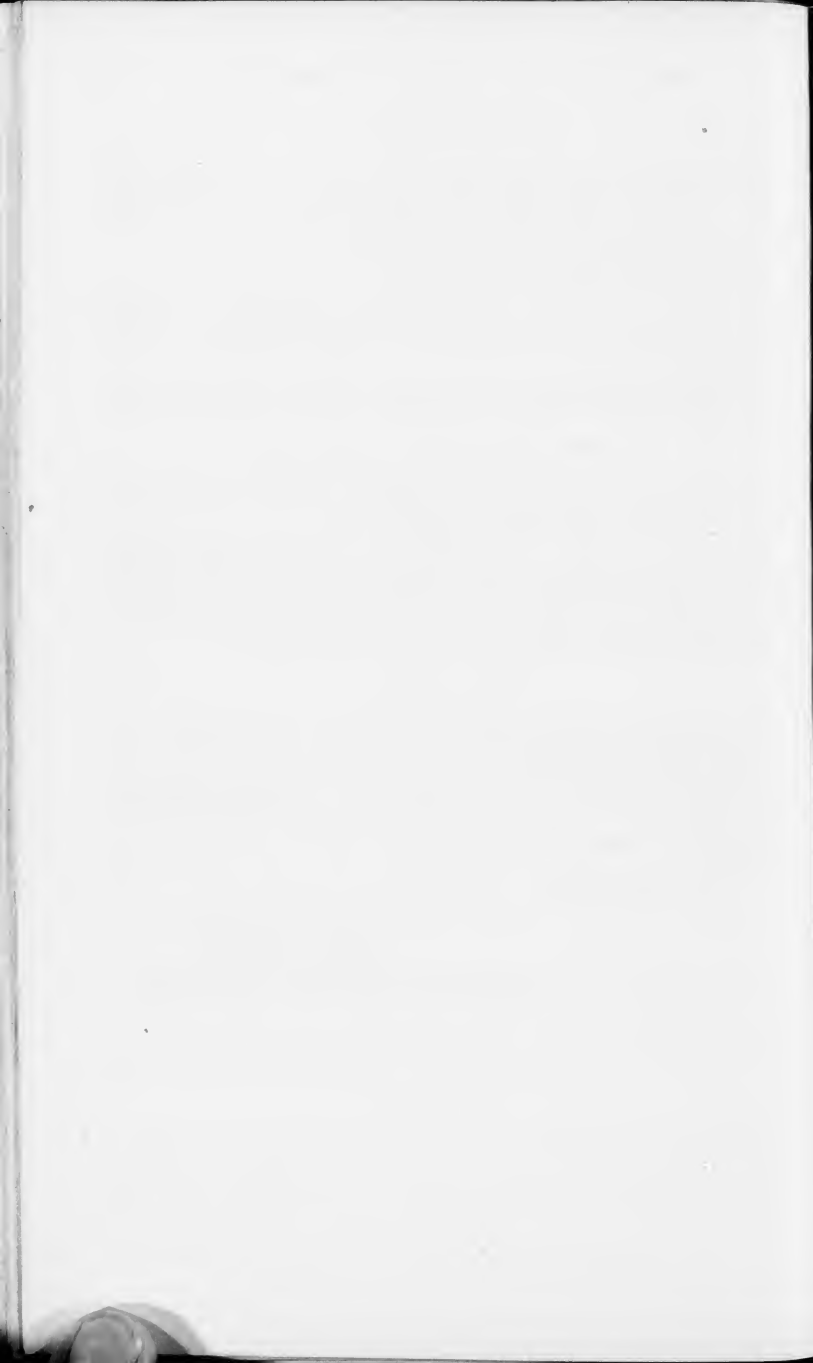
Very respectfully,

CUNO H. RUDOLPH,

JAMES F. OYSTER,

CHARLES KELLER,

Commissioners of the District of Columbia.



REPORT OF THE OPERATIONS OF THE ENGINEER DEPARTMENT OF THE DISTRICT OF COLUMBIA.

REPORT OF ASSISTANT ENGINEER COMMISSIONER BESSON.

WASHINGTON, D. C., *September 15, 1922.*

SIR: I have the honor to transmit herewith the annual reports of the operations of the various divisions and offices under my immediate supervision for the fiscal year ended June 30, 1922.

Very respectfully,

F. S. BESSON,

*Major, Corps of Engineers, United States Army,
Assistant to the Engineer Commissioner.*

The ENGINEER COMMISSIONER.

REPORT OF ENGINEER OF HIGHWAYS.

WASHINGTON, D. C., *August 15, 1922.*

SIR: I have the honor to submit the following report of the operations of the engineer of highways for the fiscal year ended June 30, 1922. The total amount of funds appropriated by Congress and deposited by corporations and others for disbursement by the highway division aggregated \$1,755,447.38, of which \$285,000 was for paving sidewalks and alleys in all parts of the District; \$144,840 for paving new roadways, \$642,500 for repairing old roadway pavements, including asphalt resurfacing; \$250,000 for repair of suburban roads; \$27,500 for construction and repair of bridges and viaducts; \$35,000 for grading streets and avenues; \$20,000 for sidewalks and curbs around Government reservations, buildings, and parks; \$30,000 for reconstructing trestle and bins in N Street NE., between First and Second Streets; while \$320,607.38 was spent in repairing pavements disturbed by other branches of the District government and by various corporations and others.

Summary of work under appropriation for improvement and repairs for year ending June 30, 1922.

Character of work.	Street improvements.	Repairs to asphalt pavements.	Total.
Sheet-asphalt pavements.....square yards..	28,827.99	32,179.15	61,007.14
Asphalt-surface pavements.....do.....	186.67	14,269.76	14,456.43
Vitrified block, gutter.....do.....	1,964.99	2,222.10	4,187.09
Cement concrete pavements.....do.....	11,486.95		11,486.95
Macadam roadway.....do.....	5,956.00		5,956.00
Old pavement removed.....cubic yards.....		4,295.58	4,295.58
Old cobble and granite removed.....square yards.....	4,030.03		4,030.03
Granite and bluestone set.....linear feet.....	7,725.90	4,973.75	12,699.65
Cement curb formed and laid.....do.....	5,603.14		5,603.14
Curb reset.....do.....	3,222.28	10,604.98	13,827.26
Grading.....cubic yards.....	181,556.30	2,431.50	183,987.80
Cement sidewalks laid under assessment and permit work.....square yards.....			37,010.85
Cement sidewalks laid around Government reservations.....do.....			6,562.96
Alley pavements, assessment and permit work, cement.....do.....			60,174.70

The following is the list of tables appended to the report:

- Table A.—Street railways in the District of Columbia, July 1, 1922.
- Tables B and C.—Statement of character and extent of street pavements.
- Table E.—Street improvements.
- Table F.—Repairs to asphalt and coal-tar pavements.
- Table G.—Work done for street railway companies.
- Table H.—Work done by day labor under appropriation for "Repairs to streets, avenues, and alleys."
- Table I.—Regular permit work.
- Table K.—Assessment work.
- Table L.—Replacing and repairing sidewalks and curbs around public reservations.
- Table M.—Miscellaneous work.
- Table N.—Whole-cost work.
- Table O.—Repairs to cuts by plumbers and others.
- Table P.—Grading streets, alleys, and roads.

Of the above tables, B, C, and O are printed herewith. The remaining tables are on file in the record room of the office of the engineer of highways, plan case No. B-1108.

Unit costs of work continued high. A pronounced characteristic of our field work was an unprecedented development of property by builders on many streets either newly dedicated or lacking any surface improvements. The duty of supplying such improvements thus placed upon us was beyond our means and opportunities and the results of our efforts to perform it were quite inadequate to the necessities and disappointing to the property owners and ourselves. As a partial provision against such a contingency in the future, a fund for the paving of such roadways on the deposit of the half cost by the property owners, was successfully recommended to Congress.

There were no notable individual items of street improvements and the entire street schedule was much the smallest of any within our experience.

At the end of the year all work had been practically completed except a small sidewalk contract, a contract for a concrete trestle, and one for a bridge floor.

The continued high cost of maintenance and entirely unsatisfactory condition of our heavily traveled suburban roads emphasizes the necessity of their prompt improvement with sheet asphalt on a concrete base as the only adequate correction.

Alleys were paved with cement concrete to the extent of 60,174.70 square yards.

MUNICIPAL ASPHALT PLANT.

The total output of the municipal asphalt plant for the year was 209,352 cubic feet of material, consisting of 182,328 cubic feet of old material mixture and 27,024 cubic feet of topping mixture. The plant was operated for 245 days, with an average daily output of 854 cubic feet. In connection with the output of the plant, the crusher was operated for 72 days during the year and 4,592 cubic yards of old material hauled to the plant from various streets was crushed.

Constant attention is given to the maintenance of both the plant and the crusher, repairs being made and parts replaced when necessary, thereby keeping them in the best operating condition possible. This cost is incorporated in the total cost of output shown below.

The following materials in amounts set forth below were purchased for use in manufacturing the output during the year:

Limestone dust, 250 tons, cost average.....	\$4.86
Sand, 3,220 cubic yards, cost average.....	1.81
Asphaltic cement, 521.32 tons, cost average.....	22.18

There were purchased for use in operating the crusher and mixer the following large items:

Fuel oil, 39,940 gallons, cost average.....	\$0.0545
Coal, 208 tons, cost average.....	7.30
Wood, 75 cords, cost average.....	16.04

The cost of operation, including labor and material, are kept from day to day and the summary of this data for the fiscal year develops the following unit costs for the year's operation:

Operation of crusher.

[Period of operation, 72 working days: output of crusher, 4,592 cubic yards.]

Labor and fuel (cost per cubic yard, \$1.03).....	\$4,732.62
Maintenance, renewals, and repairs (cost per cubic yard, \$0.118).....	544.49
Overhead cost: The original cost was amortized by deducting 20 per cent from same each year during the first five years of its life.	
Cost of crushed product per cubic yard:	
Labor and material.....	1.03
Repairs to plant.....	.118
Total cost.....	1.148

Operation of plant.

[Period of operation, 245 days: total output, 209,352 cubic feet.]

At plant:	
Labor (8.96 cents per cubic foot).....	\$18,763.73
Fuel oil (0.96 cent per cubic foot).....	2,010.96
Coal (0.65 cent per cubic foot).....	1,365.71
Wood (0.27 cent per cubic foot).....	565.25
Total (10.84 cents per cubic foot).....	22,705.65
Haul from plant to street:	
Labor (8.01 cents per cubic foot).....	16,545.85
On street:	
Labor (25 cents per cubic foot).....	51,664.19
Painting joints (0.34 cent per cubic foot).....	762.44
Wood (0.30 cent per cubic foot).....	628.06
Total (25.64 cents per cubic foot).....	69,600.54
Maintenance and repairs:	
At plant (1.30 cents per cubic foot).....	2,728.38
On street (0.30 cent per cubic foot).....	630.52
Total (1.60 cents per cubic foot).....	3,358.90
Overhead: The original cost was amortized by deducting 20 per cent from same each year during the first five years of its life.	
Supervision:	
Foremen and overseers (3.12 cents per cubic foot).....	6,538.05
Total manufacturing cost per cubic foot:	
Plant labor.....	\$0.1084
Hot haul.....	.0801
Street work.....	.2564
Maintenance of plant and tools.....	.0160
Supervision.....	.0399
Total.....	.5008

The sand used was bought under contract at 80 cents per cubic yard and hauled from the wharf to the plant at the cost of \$3,221.20 for 3,204.50 cubic yards, or \$1.01 per cubic yard, a total of \$1.81 per cubic yard. All other expendable material was delivered at the plant site at the cost thereof used herein.

The cost of a cubic foot of old material mixture from the above was as follows:

0.65 cubic foot of old material, at \$1.15 per cubic yard	\$0.0277
0.35 cubic foot sand, at \$0.80 per cubic yard; hauled, \$1.01 per cubic yard ..	.0234
3.33 pounds limestone dust, at \$4.86 per ton .....	.0080
5.04 pounds asphaltic cement, at \$22.18 per ton .....	.0558

Cost of material1149
Manufacturing and placing cost5008

Total cost per cubic foot6157
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Topping mixture:

1 cubic foot of sand, at \$0.80 per cubic yard; hauled, \$1.01 per cubic yard ..	.0670
4.20 pounds limestone dust, at \$4.86 per ton .....	.0102
10.08 pounds asphaltic cement, at \$22.18 per ton .....	.1117

Cost of material .....	.1889
Manufacturing and placing cost .....	.5008

Total cost per cubic foot6897
---------------------------------	-------

The total cost of minor repairs to sheet asphalt pavements during the year, the same representing the maintenance cost during the year, was \$94,489.18. This cost represented the maintenance of all asphalt and asphaltic concrete streets not under guaranty by contractors, a total yardage of 3,507,419. The cost per square yard per year was therefore about 2.69 cents.

For purposes of record and comparison the like annual costs are here stated for past years: 1908, 3.8 cents; 1909, 2.3 cents; 1910, 2.6 cents; 1911, 2.2 cents; 1912, 2.4 cents; 1913, 2 cents; 1914, 1.9 cents; 1915, 1.9 cents; 1916, 1.8 cents; 1917, 1.5 cents; 1918, 1.7 cents; 1919, 3.07 cents; 1920, 3.38 cents; 1921, 3.75 cents.

The municipal asphalt plant began operations in 1912, repairs being made by contract during the first quarter of that year, and with the municipal asphalt plant during the last three quarters of that year and continuously since. The marked reduction for the year 1917 is affected very significantly by the law effective that year by which repairs to pavements over one year old are chargeable to repair appropriations instead of being paid for by the paving contractors under a five-year guaranty, as formerly. The yardage of pavement over which our repairs were distributed was thus increased by nearly 700,000 square yards, on which practically no expenditures were needed, as the pavements were only from one to five years old.

In connection with these costs of annual repair it should be considered that some of the streets approximate an age of 40 years and that the average age of those we have resurfaced in recent past years exceeds 25 years. The average age of streets resurfaced in 1910 was 25.8 years; in 1911, was 24.5 years; in 1912, was 25.8 years; in 1913, was 26 years; in 1914, was 28.5 years; in 1915, was 28 years; in 1916, was 29.6 years; in 1917, was 27 years; in 1918, was 26 years; in 1919, was 26.7 years; in 1920, was 23.6 years; in 1921, was 23.2 years; in 1922, was 28.7 years.

During the year there was purchased from the Cranford Paving Co., under contract No. 7324, the following material in bulk at contractor's plant, to be used in connection with minor repairs to asphalt pavements and repairs to cuts:

6,072.00 cubic feet of topping, at 47 cents per cubic foot	\$2, 853. 84
6,004.00 cubic feet binder, at 41 cents per cubic foot	2, 461. 64
Total	5, 315. 48

This was material hauled from plant and laid in the streets by the District of Columbia minor-repair forces.

This procedure was in continuation of that of the preceding year, though more limited as to amount involved. The municipal plant alone could hardly have met the aggregate needs of our work and was not subjected to the injurious strain of attempting it.

My acknowledgments are due to the employees of this division for the work accomplished by the office during the year.

STREETS.

Repairs to streets, avenues, and alleys, appropriation 1922, were made under the immediate supervision of the superintendent of streets, as follows:

Concrete roadway	square yards..	110
Brick sidewalk relaid	do.....	11, 857
Asphalt block paved	do.....	942
Asphalt black repaved	do.....	15, 674
Vitrified block paved	do.....	2, 087
Vitrified block repaved	do.....	5, 404
Curb reset	linear feet..	1, 625
Flag relaid	square yards..	98
Granite block laid	do.....	7, 434
Cement walk relaid	do.....	4, 431
Grading	cubic yards..	5, 640
Labor		\$117, 180. 72
Material		\$11, 983. 89

SUMMARY.

Northwest section, east of Sixteenth Street	\$42, 387. 29
Northwest section, west of Sixteenth Street	14, 895. 00
Northeast section	29, 737. 74
Southeast section	23, 048. 86
Southwest section	12, 301. 58
Georgetown	9, 954. 95
Total	132, 325. 42

SUBURBAN ROADS.

The appropriations expended under the immediate supervision of the superintendent of suburban roads for the year ending June 30, 1922, are as follows:

For repairs to suburban roads and streets	\$250, 000
For repairs to streets, avenues, and alleys (direct charge)	¹ 43, 588
For grading streets, alleys, and roads	35, 000
Special appropriations for grading—	
Second Street, Eastern Avenue to Whittier Street	10, 795
Thirteenth Street NW., Buchanan Street to Shepherd	14, 155
Paving cement roadways, suburban	45, 855

¹ In addition to this a large amount of suburban work was done from this appropriation.

In addition to the above all cuts in the suburban area were repaired by this division.

Tabulated statements of work done are on file in this office.

The recommendations made in the previous reports of this office relative to the early paving of trunk highways, the use of bituminous macadam on roadways of secondary importance, and as to restrictive legislation limiting the weights of loaded vehicles, are respectively renewed.

BRIDGES.

The following work, under the immediate supervision of the engineer of bridges, was performed during the year:

Reflooring of Chain Bridge, part of Pierce Mill Road Bridge over Piney Branch, Connecticut Avenue Bridge over Klinge Road, and Kenilworth Avenue Bridge over Watts Branch.

Painting of the Calvert Street, P Street, M Street, and K Street Bridges over Rock Creek.

Culverts were constructed at Bladensburg Road and Queens Chapel Road and at Canal Road west of Foxall Road.

A concrete floor was constructed on the bridge on Forty-fourth Street over Watts Branch and a timber floor on bridge at Kenilworth Avenue and Polk Street NE.

Minor repairs were made to various bridges.

The appropriations for the Highway and Anacostia Bridges were expended practically in full.

EXPENDITURES FOR BRIDGE REPAIRS, PAINTING, CONCRETE WORK, ETC.

Repairs to N Street oil trestle by day labor.....	\$444. 28
Repairs to hand rail and painting portion of floor system by day labor on the Highway Bridge.....	1, 710. 50
Moving of scale house at the N Street trestle completed by day labor...	784. 29
Spot painting of girders on the Anacostia Bridge completed by day labor...	296. 61
Construction of two clearance gauges at the Highway Bridge commenced, one gauge completed by day labor.....	471. 91
Grading approach to scale house at the N Street trestle completed by day labor.....	62. 40
Alteration to revetment wall at Wharf No. 6, Water Street between M and N Streets SW.....	87. 50
Construction of concrete retaining wall on Canal Road west of the Aqueduct Bridge completed under contract with the Warren F. Brenizer Co.	48, 663. 59
Contract completed with the Miller & Dorsey Co. for driving and capping bearing piles and dredging at Wharf No. 6.....	11, 486. 82
Contract with Royal J. Mansfield for the construction of new roadway floor on the Calvert Street Bridge.....	¹ 17, 798. 00
Contract with the Cambridge Manufacturing Co. for construction of reinforced-concrete wharf decks at Wharf No. 6.....	¹ 14, 260. 00
Contract with the Allen H. Rogers Co. for construction of 9 reinforced-concrete stalls at the N Street trestle.....	¹ 9, 643. 50
Contract with Royal J. Mansfield for the construction of 12 concrete bins at the N Street trestle.....	¹ 14, 984. 00

¹ The work is in progress

ENGINEER STABLES.

The engineer stables, housing 60 horses and 22 mules, are located at U Street NW. between Sixteenth and Seventeenth Streets, and First and Canal Streets SW. The animals are assigned to the various departments as follows:

Sewer division.....	30
Repair shop.....	22
Repairs to cuts.....	22
Surface division.....	5
Scaler weights and measures.....	1
District surveyor.....	1
Electrical department.....	1

Number of annual employees: 1 superintendent, 1 blacksmith, 2 drivers, 2 watchmen.

My acknowledgments are due to the employees of this division for the work accomplished by the office during the year.

Very respectfully,

C. B. HUNT,
Engineer of Highways.

ASSISTANT TO THE ENGINEER COMMISSIONER.

TABLES B AND C.—*Character and extent of roadway pavements July 1, 1922.*

SQUARE YARDS.

Section.	Asphalt.	Asphalt block.	Asphaltic concrete, concrete base.	Asphaltic concrete, stone base.	Cement concrete.	Durax block (small granite block).	Granite and rubble.
Northwest.....	1,817,663	25,323	9,674	6,372	20,999	12,294	96,627
Northeast.....	406,794	193,962	3,127	.....	11,825	.....	18,289
Southeast.....	262,954	238,437	8,019	4,082	1,324	.....	37,199
Southwest.....	286,102	40,436	13,535	.....	11,148	.....	149,638
Georgetown.....	156,171	23,076	4,144	905	.....	5,674	30,492
Northwest suburban.....	389,138	84,046	25,855	36,680	172,150	.....	23,945
Northeast suburban.....	82,372	6,925	14,354	.....	31,326	.....	.....
Southeast suburban.....	21,203	.....	.....	3,049	12,933	.....	1,000
Total.....	3,422,397	612,205	78,708	51,088	261,705	17,968	357,190

Section.	Vitrified block.	Cobble.	Macadam (estimated).	Gutters on asphalt streets.	Gutters on asphaltic concrete streets.	Pave-ments main-tained by street railroads.	Total.
Northwest.....	9,855	5,763	22,517	119,518	1,128	287,110	2,434,843
Northeast.....	3,882	.....	30,416	32,379	231	69,316	770,221
Southeast.....	.....	13,122	45,465	18,316	898	48,328	678,144
Southwest.....	3,138	7,070	10,136	24,527	1,254	56,820	603,804
Georgetown.....	515	10,419	3,000	5,979	498	31,816	272,689
Northwest suburban.....	.....	.....	1,303,633	28,496	5,871	54,765	2,124,579
Northeast suburban.....	.....	.....	385,481	5,764	1,049	9,000	536,271
Southeast suburban.....	.....	.....	73,662	6,385	272	7,370	125,874
Total.....	17,390	36,374	1,874,310	241,364	11,201	564,525	7,546,425

TABLES B AND C.—Character and extent of roadway pavements July 1, 1922—Contd.

MILEAGE.

Section.	Asphalt.	Asphalt block.	Asphaltic concrete, concrete base.	Asphaltic concrete, stone base.	Cement concrete.	Durax block (small granite block).
Northwest.....	93.42	1.57	0.51	0.24	1.15	0.30
Northeast.....	21.38	8.58	.19	.....	.80	.....
Southeast.....	13.93	11.93	.43	.17	.09	.....
Southwest.....	15.51	2.37	.68	.....	.36	.....
Georgetown.....	9.30	1.51	.49	.06	.....	.27
Northwest suburban.....	21.69	4.52	1.31	2.00	9.37	.....
Northeast suburban.....	5.15	.63	.97	.....	1.79	.....
Southeast suburban.....	1.83	.....	.....	.21	.51	.....
Total.....	182.21	31.11	4.58	2.63	14.07	.57

Section.	Granite and rubble.	Vitrified block.	Cobble.	Macadam (estimated).	Gravel and unimproved (estimated).	Total.
Northwest.....	5.45	0.50	0.08	1.00	2.54	106.76
Northeast.....	.91	.24	.....	1.60	4.36	38.06
Southeast.....	2.14	.....	.66	2.15	6.40	37.90
Southwest.....	7.75	.27	.30	.49	2.62	30.35
Georgetown.....	2.12	.03	.48	.06	.76	15.08
Northwest suburban.....	1.13	.....	.....	81.97	52.67	174.66
Northeast suburban.....	.....	.....	.....	27.63	43.39	79.56
Southeast suburban.....	.04	.....	.....	5.68	36.60	44.87
Total.....	19.54	1.04	1.52	120.58	149.34	527.24

TABLE O.—Number of square yards and cost of repairs to cuts in various streets, sidewalks, and alleys during the fiscal year ending June 30, 1922, chargeable to plumbers, public service corporations, individual depositors, and appropriations of the District and Federal Governments.

	Flat rate.	Whole cost.	Total.
Plumbers.....	\$19,732.11	.....	\$19,732.11
Public service corporations.....	49,749.88	\$150,616.35	200,366.23
Individual depositors.....	13,510.79	.....	13,510.79
Various appropriations of the District and Federal Governments.....	40,041.41	46,956.84	86,998.25
	123,034.19	197,573.19	320,607.38

	Flat rate.	Whole cost.
Square yards repaired:		
Sheet asphalt.....	\$4,081.95	\$7,081.44
Vitrified block.....	1,168.44	7,629.02
Asphalt block.....	2,018.75	8,768.00
Granite block.....	883.25	3,126.40
Cobble.....	235.11	869.64
Cement sidewalks.....	11,347.81	.....
Brick sidewalks.....	1 3,642.00	8,791.60
Macadam.....	2,582.58	4,799.64
Durax block.....	24.55	6,031.20
Scoria block.....	26.81	1,232.36
Concrete roadways.....	3,678.87	.....

1 Square feet.

REPORT OF THE INSPECTOR OF ASPHALTS AND CEMENTS.

SEPTEMBER 1, 1922.

SIR: I have the honor to submit the following report showing the operations of this division during the fiscal year ended June 30, 1922.

The volume of work of the division during the year represented by the number of tests made show a total number of 10,306 samples submitted which were analyzed, tested, and examined.

There were also a number of miscellaneous laboratory tests made on Portland cement, asphalt cement, sand and gravel, prepared in connection with special experiments conducted under your personal supervision.

ASPHALT PAVEMENTS.

During the year there were laid by the Cranford Paving Co. and Corson & Gruman Co., contractors for the laying of new and resurfacing asphalt pavements, approximately 75,463.57 square yards, in which Aztec and Standard asphalts were used.

The municipal asphalt plant produced about 209,352 cubic feet of old material and topping mixtures, used in the patching and repairs to asphalt pavements in which Standard asphalt was used.

PORTLAND CEMENT.

The testing of 8,222 samples represent 82,243 barrels, with no rejections.

Results of tests and by whom submitted are shown in Tables Nos. 7 and 8, on file in this office.

The work of this office has been kept current and is current to date.

Very respectfully,

J. W. DARE,

Inspector of Asphalts and Cements.

ASSISTANT TO ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT OF TREES AND PARKINGS.

WASHINGTON, D. C., August 15, 1922.

SIR: I have the honor to submit my annual report dealing with the operations of the trees and parkings office for the fiscal year ended June 30, 1922.

TREES PLANTED.

Two thousand three hundred and forty-seven young trees were planted in their permanent position on the streets during the fiscal year, 108 less than the number planted the previous year. Almost all of the trees planted were for the purpose of filling vacancies in existing rows in the Northwest and Southwest sections of the city. Of the number planted, 2,342 were set at the curb line, 3 in the parking between the inner edge of the sidewalk and the building line, 1 at the public comfort station, Fifteenth Street and Maryland Avenue NE., and 1 in the central parking, Fourteenth Street NW., between Montague Street and Park Place. The work of preparing

the tree spaces during the fiscal year was performed at various times between October 11, 1921, and April 19, 1922, some time being lost between these dates due to the unusually severe weather in the winter. The planting of the trees in these spaces was undertaken last spring. The planting of trees continues to be a costly item in view of the existing high price of labor and materials of all kinds and the long hauls to dumps. The cost of planting 2,307 was paid for from the appropriation for the parking commission, 29 from appropriations for other departments, and 11 from whole-cost deposits. The sum of \$9,616.88 was expended from the appropriation for the purchase of material for tree boxes, straps, stakes, etc., lifting trees in the nursery for street planting, making boxes, digging tree holes, planting trees, and cost of soil.

TREES REMOVED.

Hundreds of trees die annually because of injuries over which this department has no control. In addition to natural enemies, the unfavorable city conditions make the life of a street tree a hard one. The chief sources of injury to shade trees are the generally poor conditions of the soil along the streets, which is continually being impoverished by the growing trees, and our inability to fertilize them because of the cement walks and pavements. During the year 262 old silver maple trees were removed from both sides of H Street NE., between Second and Fifteenth Streets, and the same were replaced with 174 Norway maples. In connection with street improvements it was necessary to remove 14 silver maples and 1 Norway maple from the north side of U Street SE., between Fourteenth and Fifteenth Streets, and the same were replaced with 13 Norway maple trees, and 9 silver maple trees were removed on the north side of Pleasant Street SE., between Nichols Avenue and Thirtieth Street, and replaced with 15 Norway maples. A total of 2,518 trees were removed during the fiscal year for various reasons.

Of the 2,518 trees removed during the year, 262 were decayed and dangerous; 237 were of inferior and condemned varieties; 8, to relieve excessive shade; 108, street improvements; 13 for driveways; 1 for vault; 14, improvements to alleys; 49, accidents; 90, storms; 25, close proximity to buildings; 10, interference with building operations; 5, interference with traffic; 1, interference with a lamp; 1, injurious to private property; 33, injurious to curb trees; and 27 interfered with the construction of sewer. It was ascertained that 26 trees were destroyed by illuminating gas, 95 by salt water, 353 by abnormal moisture supply, 109 by being filled around, 16 by being girdled, 109 by drought, 1 by insects, 112 by root mutilation, 6 by oil, 7 by sewer gas, 9 by being overshadowed, 18 by horse bite, 3 by frost, and the deaths of 770 were unexplained.

Of the number removed, 2,256 stood at the curb line, 154 in the parkings, 46 in the sidewalk, 7 in alleys, 23 in the roadways, and 32 in playgrounds.

The cost of removing 2,333 trees was paid for from the appropriation for the parking commission, 155 from the appropriations for other departments, and 30 from whole-cost deposits. The cost of removing the trees paid from the appropriation for the parking commission was performed at a total cost of \$4,879.55.

TREES SPRAYED.

Street trees, like all other forms of vegetation, are subject to attack of insects and diseases. It was necessary to spray the trees for the destruction of leaf-eating insects during the year, and as a result 37,990 trees were sprayed for the extermination of the elm-leaf beetle, tussock moth, and the fall webworm. This office was unable to treat the trees during the winter with lime-sulphur solution for the destruction of scale insects, due to the limited appropriation available to plant and care for the shade trees of this city. The work of spraying the trees was performed at a total cost of \$2,301.01.

NURSERIES.

This department is still occupying the ground at Fort Dupont for the propagation of trees for street planting, and while the soil is well adapted for tree nursery purposes there is not a sufficient amount of ground available in this tract to grow the total number of trees necessary to keep up with the rapid growth of the city, even if adequate funds are provided. The total number of seedlings transferred from the seed beds to the nursery rows last spring was 4,526, and of this number 1,535 were Norway maples, 542 red maples, 828 red oaks, 1,393 pin oaks, and 228 elms. These trees will be available to plant to their permanent position on the streets in the next five years. At the end of the fiscal year there were 4,783 trees planted in the nursery rows at Fort Dupont nursery.

TRIMMING.

No systematic trimming was undertaken during the year, but to offset this a great many individual requests for trimming trees, removing objectionable limbs, etc., were given attention. In executing orders for work of this nature in compliance with requests many trees in the immediate vicinity were trimmed. There are a great many old silver maple trees in the down-town section of the city, and they should all be removed and replaced with better varieties. This work can not be undertaken with the present limited appropriation without neglecting other important work. The silver maples are fast deteriorating, and as a matter of safety to the public many of them should be severely trimmed, topped off, etc. This treatment will improve their general appearance and prolong their life for a short period. A total of 8,796 trees were trimmed during the year at a total cost of \$3,519.90.

It is the intention to undertake the systematic trimming of all the trees on the streets in the northwest section of the city, starting west of Eighteenth Street and south of Florida Avenue, as soon as practicable after the beginning of the fiscal year 1923, and continue this work until it has to be discontinued for other more urgent work.

CULTIVATING YOUNG TREES, MOWING PARKINGS, AND REMOVING TREE BOXES.

The usual amount of cultivation of young trees was performed during the year. This work is absolutely necessary to insure good growth in young specimens, allowing them to derive the fullest benefit from rainfall.

Too much stress can not be laid upon the importance of cultivation, the full value of which is not appreciated. This cultivation is not only beneficial to the young trees, but also destroys a rank growth of weeds that would otherwise spring up around them, and the same would be unsightly. The keeping of the soil around trees cultivated and free from weeds is one of the most important aids to their growth, and also allows air to reach the roots, renders more available the plant food the soil contains, and also prevents the rapid evaporation of moisture. A total of 18,847 trees were cultivated during the year at a total cost of \$2,839.74.

Many uninclosed public parkings were mowed during the year, the necessity being recognized to rid the city of as many weeds as possible. This work was performed between July 1 and October 18, 1921, and from August 20 to October 18, 1921, a majority of the outside employees were engaged on this work. The mowing last year was performed at a total cost of \$3,203.64.

In addition to the removal of the weeds along the streets this office mowed the grass at various times on the lawn in front of the District Building and the park in front of the Center Market at Seventh Street and Pennsylvania Avenue NW.

During the fiscal year 1,426 old wooden tree boxes and 165 iron tree guards were removed, as the trees were large enough to do without their support. Many of the wooden boxes were in a dilapidated condition and they gave the street an unsightly appearance.

PAVING OF ABANDONED TREE SPACES.

The work of paving abandoned tree spaces throughout the city was not undertaken very extensively during the year. This work is performed by the Surface Division, Engineer Department, and the cost of the same is paid from the appropriation for the Parking Commission. A total of \$133.54 was spent on this work.

REGULATION OF TERRACES.

The regulation of terraces throughout the city is proceeding satisfactorily and in the recently built up sections of the city the uniformity in their heights presents a pleasing appearance. This office examined and issued 1,375 permits affecting the grade of terraces in connection with building operations during the year. There was a very noticeable increase in the number of permits issued during the year over several previous years.

• GENERAL COMMENT.

I wish to call attention to a few facts about the trees of Washington. Shade trees are living, breathing things, and on the streets are expected to grow, thrive, and be kept free from insects, when everything but what nature intended is present to prevent their proper development; cement walks which keep out the water, gas leaks to poison the soil, and other injurious factors, all militating against their proper and permanent growth.

In the largest tree city in the world, which we have the honor of living in, we will necessarily have more insects than other municipalities, as they are always present on trees to a certain extent.

spraying, which is carried on with great difficulty, due to traffic and the danger of defacing private property, does not kill by contact, but is a stomach poison, and it is almost impossible to poison every leaf on every tree. We should be thankful if we can keep the trees in foliage during the hottest months of summer. When spraying is necessary, all trees need it at the same time, and with a row of 500 miles of shade trees and horse-drawn sprayers it is a three months' job.

With an appropriation smaller than pre-war, and wages a hundred per cent greater, it can readily be seen that if the city is to grow more money is necessary to keep up with the extensions. Surely the tree system of Washington should not be extended when by so doing the fine rows of existing trees must be neglected. Ever mindful of the need for economy, I believe that, until Congress in its wisdom sees fit to increase the appropriations for this department, we should take care of what we have to the best of our ability. The money available is not enough to properly care for the existing trees, but in the future, as in the past, everything possible will be done to preserve the trees, with the realization that many people will be disappointed because their trees are not given more attention, but as they are not in the position to observe all the trees, they must understand that the department will do those things first that are deemed urgent.

SUMMARY.

Curb trees on streets at close of fiscal year 1921	105,803
Net increase of curb trees during fiscal year 1922	86
Curb trees on streets at close of fiscal year	105,889

Very respectfully,

C. LANHAM,
Superintendent of Trees and Parkings.

ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF THE CITY REFUSE DIVISION.

WASHINGTON, D. C., July 31, 1922.

SIR: I have the honor to submit the following report of the work done by the city refuse division, engineer department, for the fiscal year ended June 30, 1922.

Eight hundred thousand dollars was appropriated for the collection and disposal of garbage, ashes, and miscellaneous refuse, and \$375,000 for dust prevention, cleaning of streets and alleys, and snow removal. Because of the exceptionally heavy snowfall in the last days of January, necessitating extraordinary expenditure for its removal, an additional sum of \$30,000 was appropriated by the Congress to cover this cost.

SNOW REMOVAL.

This snow clearly indicated that the equipment available for such work was entirely inadequate. To cover this deficiency, trucks, plows, and tractors have been purchased with which to keep the streets open for travel in future snowfalls.

STREET AND ALLEY CLEANING.

Tables are appended which show the yardage cleaned by the several different methods and the cost of each. It is interesting to note that the unit costs per thousand square yards have returned to about pre-war costs.

An innovation this year was the use of motor-driven sweepers. The cleaning was done in this way at a cost considerably less than by horse-drawn machines.

As in the two previous years the refuse from Center, Western, and Eastern Markets was collected and disposed of as a street-cleaning function at a cost of \$992.20.

GARBAGE COLLECTION AND DISPOSAL.

The amount of garbage collected was over 15 per cent greater than in the previous year, a total this year of 69,452 tons. This collection cost \$233,640.60.

The cost of disposal of this garbage was \$154,799.62. The revenue derived from grease sold was \$121,532.07. In addition to the grease some 9,000 tons of press cake were produced, but because of prevailing low prices only 200 tons of this were converted into tankage and sold.

After deducting the cost of drying, grinding, and screening, this press cake has a net value of about \$3 a ton, so that notwithstanding low prices the cost of disposal of the city's garbage (included in which is the expense of freight from Washington to the reduction plant at Cherry Hill) was but slightly over \$5,000.

ASHES.

Because of the cold winter, the quantity of ashes collected and disposed of was greater than usual, amounting to 156,100 cubic yards.

These ashes were deposited in low ground in various sections of the District, but it is to be noted that such places are increasingly difficult to obtain, and the haul each year is becoming longer.

MISCELLANEOUS REFUSE.

The cost of the collection and disposal of miscellaneous refuse from householders was \$194,805.64, but there was salvaged and sold sundry material to the value of \$67,458.68, so that the net expense of this work was \$127,346.96. The plant of the former contractor for this work, located at Mount Olivet Road and Montello Avenue, was leased and used in this salvaging process.

GENERAL.

On April 1, 1922, a new scale of wages became effective reducing those employees receiving less than \$3.36 per day by 8 cents, those receiving between \$3.36 per day and \$5.36 per day by 16 cents, and those receiving over \$5.36 per day by 24 cents. The prevailing rate of pay for unskilled laborers is \$2.72 per day, drivers \$2.88 per day, and garbage collectors \$3.28 per day.

As previously indicated, the amount of refuse to be collected is increasing materially, and whatever accumulates must be disposed of. Rows of new houses are being built, many of them in the suburbs, so that the average haul is constantly becoming longer. As stated in my last annual report, new equipment, repairs to plant, and added facilities not permitted by previous appropriations are absolutely necessary.

For the work accomplished during the past year, my acknowledgments are due the employees of this division.

Very respectfully,

MORRIS HACKER,
Supervisor City Refuse.

ASSISTANT TO THE ENGINEER COMMISSIONER.

Cost of street cleaning July 1, 1921, to June 30, 1922.

	Area (square yards).	Cost.	
		Amount.	Unit per M.
Machine cleaning, motor.....	45,140,000	\$9,974.13	\$0.221
Machine cleaning, horse.....	66,194,000	20,337.33	.307
Alley cleaning.....	57,288,000	35,171.92	.614
Suburban cleaning.....	50,221,000	19,887.76	.395
Hand patrol.....	1,357,169,000	208,573.06	.154
Motor flushing.....	48,223,000	6,498.78	.135
Squeegeeing.....	94,650,000	14,286.34	.151
Sprinkling.....		3,825.67	
Dumpmen.....		3,479.35	
Property accounting.....		2,104.73	
Waste-paper boxes.....		2,248.75	
Snow and ice.....		34,646.38	
Annual overhead.....		2,452.03	
Sunday cleaning.....		2,091.91	
Total.....		365,578.14	

Yearly cost of cleaning by various methods.

Class of work.	Average thousand yards under attention.	Total cost.	Average cost for each thousand yards under attention for year.	Thousand yards cleaned.	Average number of cleanings for year.
Hand patrol ¹	5,020	\$208,573.06	\$39.50	1,357,169	272
Machine cleaning, horse.....	444	20,337.33	45.80	66,194	149
Machine cleaning, motor.....	394	9,974.13	25.25	45,140	115
Alley cleaning.....	1,205	35,171.92	29.20	57,288	48
Suburban streets.....	2,089	19,887.76	9.52	50,221	24
Squeegeeing.....	1,193	14,286.34	11.97	94,650	79
Motor flushing.....	860	6,498.78	7.55	48,223	56

¹ Hand patrol work is habitually in combination with squeegeeing and flushing.

Comparative data in connection with street-cleaning work, 1918 to 1922.

SQUARE YARDS CLEANED.

	1918	1919	1920	1921	1922
Hand patrol.....	879,574,000	748,142,000	1,173,802,000	1,323,163,000	1,357,169,000
Machine, horse.....	205,504,000	218,682,000	98,350,000	119,256,000	66,194,000
Machine, motor.....					45,140,000
Alley cleaning.....	49,878,000	57,208,000	55,344,000	69,090,000	57,288,000
Suburban streets.....	38,393,000	32,876,000	34,550,000	60,382,000	50,221,000
Squeegeeing.....	125,520,000	89,868,000	111,008,000	127,596,000	94,650,000
Flushing.....	16,776,000	5,559,000	24,433,000	40,842,000	48,223,000
Motor flushing.....	12,621,000	12,213,000			

DIRECT TOTAL COST.

Hand patrol.....	\$165,521.33	\$195,665.33	\$237,490.76	\$253,485.93	\$208,573.06
Machine, horse.....	49,242.68	77,555.50	40,915.64	48,237.93	20,337.33
Machine, motor.....					9,974.13
Alley cleaning.....	30,018.51	45,118.53	44,239.33	45,696.39	35,171.92
Suburban streets.....	18,986.48	20,540.42	24,231.40	33,372.65	19,887.76
Squeegeeing.....	21,141.04	20,929.32	24,743.81	27,684.70	14,286.34
Flushing.....	7,566.84	2,757.63	6,835.91	7,424.31	6,498.78
Motor flushing.....	3,964.29	4,418.61			

COST PER 1,000 SQUARE YARDS.

Hand patrol.....	\$0.189	\$0.261	\$0.202	\$0.192	\$0.154
Machine, horse.....	.239	.354	.416	.404	.307
Machine, motor.....					.221
Alley cleaning.....	.603	.789	.800	.661	.614
Suburban streets.....		.625	.702	.519	.395
Squeegeeing.....	.168	.233	.223	.217	.151
Flushing.....	.450	.497	.279	.182	.135
Motor flushing.....	.314	.361			

Total cost of street cleaning, including all charges, except interest on investment and depreciation.....	\$365,578.14
Population served.....	437,000
Cost per capita per year.....	\$0.837

Table showing comparative data in connection with disposal of all city wastes from 1918 to 1922.

NUMBER OF UNITS COLLECTED.

	1918	1919	1920	1921	1922
Garbage.....tons..	48,874	53,258	52,793	60,058	69,432
Ashes.....cubic yards..	127,363	134,673	148,228	135,940	156,100
Miscellaneous refuse.....do..	163,291	149,650	170,286	148,908	196,763
Night soil.....barrels..	11,300	11,111	12,734	12,507	14,190
Dead animals.....number..	22,891	19,974	19,995	24,704	28,675

TOTAL NET COST.

Garbage.....	\$69,290.00	\$267,662.54	\$178,311.57	\$283,406.63	\$210,268.15
Ashes.....	68,922.64	100,300.00	114,248.38	116,421.04	135,267.18
Miscellaneous refuse.....	26,318.75	51,204.00	46,522.26	66,029.59	107,439.84
Night soil.....	14,998.00	17,500.00	17,500.00	17,500.00	17,500.00
Dead animals.....	2,988.00	3,360.00	3,360.00	3,360.00	3,360.00

MISCELLANEOUS DATA ON CONTRACTS.

Class of waste.	Contractor.	Period of contract.	Date of expiration.	Price per annum.	Collected from—
Dead animals...	Chas. F. Mann....	5 years....	June 30, 1923	\$3,360	Every part of the District.
Night soil.....	Warner Stutler....	do.....	do.....	17,500	All privies in the District.

REPORT OF THE MUNICIPAL GARAGE.

WASHINGTON, D. C., *August 18, 1922.*

SIR: I have the honor to submit the following report on the municipal garage for the fiscal year ended June 30, 1922.

For necessary transportation the garage was kept open at all times, night and day, for urgent and necessary transportation.

The labor and mechanical force consisted of eight men whose duties were repair work of all kinds, carrying the District government mail from the city post office to the District Building, and driving for the different departments which have no drivers assigned to them.

There were 44 automobiles maintained and kept in running order for the various departments of the District government. All machines washed and supplied with oil and gasoline by the night force.

The total cost for maintenance and repairs of these cars, including gasoline, oil, tires, miscellaneous supplies and labor amounted to \$18,500.67; average cost per mile was \$0.0532.

The total cost of repair parts was \$2,255.62, an average of \$51.26 per car, and an average of \$0.00752 per mile. The average mileage per car was 5,417 miles.

Owing to the crowded condition of the municipal garage it is recommended that immediate action be taken for the relief of this congestion.

The garage was constructed during the year 1917 for the maintenance of approximately 25 cars, sufficient floor space being allowed for the necessary repair work and cleaning of these cars. Additional cars purchased during the last five years have increased the number of cars at the garage to 44, which necessitates the storing of cars overnight in the aisles; of this number 7 are being stored at different places in the city, which is objectionable to the other departments housing these cars overnight. The conditions at the garage make it very difficult for the night men to wash and supply gasoline to the cars.

Very respectfully,

E. P. BROOKE,
In charge.

ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF ASSISTANT ENGINEER COMMISSIONER BROWN.

WASHINGTON, D. C., *September 15, 1922.*

SIR: I have the honor to transmit herewith the annual reports of the operations of the various divisions and offices under my immediate supervision for the fiscal year ended June 30, 1922.

Very respectfully,

CAREY H. BROWN,
*Major, Corps of Engineers, United States Army,
Assistant to the Engineer Commissioner.*

The ENGINEER COMMISSIONER.

REPORT OF THE SURVEYOR.

WASHINGTON, September 8, 1922.

SIR: The report on the work of this office for the year ended June 30, 1922 is hereby submitted for the information of the commissioners. This report also includes the condemnation of streets, parks, and alleys.

This work may be divided into three parts. First, work for private parties, for which a fee is charged. This fee is fixed by an order of the commissioners. Second, work for the various departments of the District and Federal Governments, for which no fee is charged. Third, survey, preparation, and report for all condemnation cases for streets, alleys, and parks.

Much of the time of the office force is taken up waiting on the public and answering inquiries.

Work done for private parties, for which a fee is charged, has greatly increased over any previous year. The estimates made for work well illustrate the growth of the office by a comparison of the past three years. Orders for work in 1920 were 5,795; 1921 were 8,450; while 1922 shows the unprecedented number of 11,320. This is an average of about 36 orders for work per day. This great increase in the volume is also shown by the cash receipts—1921 receipts were \$25,355.82 while this year they amounted to \$40,503.80. This is in excess of the appropriation allowed for this office by over \$7,000. While the office has been more than self-sustaining it has never been held that it should be self-sustaining for the reason that so much of the force is engaged in work for the various Government departments and in serving the public.

This increased amount of work has placed more work upon the office force than they have been able to do promptly and much more than the force is capable of doing efficiently. This work is paid for by the public and they demand prompt service and this can not be done with the present volume of work and the inadequate force.

More new lots have been created, more inspection of walls being erected, and more maps have been drawn than in any previous year in the history of the office. This increased volume of work is largely due to the great building boom that is now on in Washington.

The following table is submitted for your information and will give you a comparison of the work during the year just closed with that of the previous year:

	Fiscal year 1920-21.	Fiscal year 1921-22.
FOR PRIVATE PARTIES.		
Individual lots or parts of lots surveyed in city and county.....	3,043	5,043
Certificates of survey issued covering one or more lots.....	1,645	2,227
Duplicates of above recorded in survey certificate books.....	1,645	2,227
Separate surveys made to verify walls.....	1,084	1,700
Postal-card reports concerning walls issued to owners.....	1,084	1,700
Individual buildings inspected as to location of walls.....	1,268	3,022
Large tracts in county surveyed, subdivided, and recorded.....	25	21
Outline surveys in county of unsubdivided tracts.....	163	78
Subdivision plats prepared in duplicate.....	228	532
Duplicate subdivisions prepared for assessor.....	228	532
Subdivisions recorded.....	212	470
Total of individual new lots in subdivisions.....	2,814	3,878
Plats of one or more recorded lots to accompany applications for building permits (commonly called "building plats"), in duplicate.....	3,427	5,643

	Fiscal year 1920-21.	Fiscal year 1921-22.
FOR PRIVATE PARTIES—continued.		
Plats made up under regulations for theaters, garages, etc.....	157	152
Estimates of cost issued in triplicate.....	8,450	11,320
Plats made up on order of private parties.....	5,645	8,658
Total of fees paid to collector of taxes by private parties.....	\$25,355.82	\$40,503.80
FOR THE DISTRICT OF COLUMBIA.		
Surveys made for the District of Columbia.....	207	109
Plats recorded (condemnations, dedications, etc.).....	54	69
Reports concerning walls to building inspector.....	1,084	1,700
Assessment and taxation plats recorded.....	592	415
MISCELLANEOUS.		
Total of surveys for the District of Columbia and private parties.....	3,124	4,135
Total of plats, public and private, including plats drawn in books.....	8,204	12,100

CONDEMNATION OF STREETS, PARKS, AND ALLEYS.

During the past year 46 condemnation cases have been before the courts, divided into 26 street and building restriction line cases, 8 park cases, and 12 alley cases.

The amount awarded as damages for the opening of streets and establishing building restriction lines, and the acquisition of parks, was \$127,641.94, and the total amount of damages for alleys \$7,715.42, making a total for all condemnation cases of \$135,357.36. The number of street, park, and building restriction line cases not yet filed in court were nine, and seven alley cases.

Some of the more important cases now in court are (1) the opening of all streets in Barry Farm west of Nichols Avenue; (2) the opening of Webster, Allison, and Buchanan Streets and Arkansas Avenue; (3) the opening of Western Avenue between Massachusetts and Wisconsin Avenues; (4) and the widening of Southern Avenue between Bonini Road and Livingston Road.

This office has completed the work necessary for the condemnation of the balance of all the streets in Barry Farm. This, in connection with the condemnation of streets west of Nichols Avenue constitutes the largest individual case for the opening of streets this office has ever submitted to the corporation counsel for condemnation. When the balance of these streets have finally been acquired, it will complete a project which this office has worked upon for many years, and it is thought will prove of great benefit to this large area, which has been without public streets and other improvements, such as water, sewer, sidewalks, etc., since about 1874.

One of the larger projects being prepared by this office for condemnation will be an attempt to widen Canal Street from Thirty-sixth and M Streets, Georgetown, to the Conduit Road. This street is very narrow and badly congested, and it is hoped a way can be provided for its widening.

Survey has about been completed for the widening of Broad Branch Road from the District line to Rock Creek Park. This will open up a beautiful territory and provide better facilities for traffic where it is much needed.

The office is also engaged in a survey preparatory to the widening of Benning Road from Anacostia Avenue (Bennings) to the District

line. It is believed that this should be condemned before improvements are constructed within the lines of the proposed street, and thus make its widening prohibitive.

A table showing the street, park, and alley cases pending, confirmed, and recommended by this office but not yet filed, is on file in this office.

PARKS.

The plan of the Federal city made by L'Enfant in 1791 provided for a comprehensive street plan and beautiful parks. Washington is justly famous for its wide streets and magnificent parks. Outside of what was the original Federal city, bounded by Florida Avenue (formerly Boundary Street), there was a very comprehensive street plan adopted in 1893. This plan, known as the highway plan, covers the entire District of Columbia. No land may be subdivided that does not conform to this plan, and the District therefore is being subdivided in a comprehensive and orderly manner; but there is no provision for a park plan that has any force of law, and any parks that are to be acquired can not be taken over without special legislation. If subdivisions of land are allowed to continue without any adequate provision for parks, the entire District of Columbia will be subdivided without any chance of securing the ground for this important movement. Much of the land at the present time is sparsely settled and comparatively cheap, which is now specially adapted for park purposes. These attractive spaces should be preserved so that the people can walk and ride through them and the children play in the open. There is nothing which will promote the health and happiness of the people of a city more than to have outdoor recreation and playgrounds. Many of the magnificent trees and beauty spots are being destroyed, and others will be destroyed with the rapid development of the District. The new Washington, being created beyond Florida Avenue, will not have the liberal park area provided in the old Washington. It is a reflection upon the present generation not to provide as beautiful a city as the designers of the old original city.

This office has from time to time recommended the acquisition of Piney Branch parkway, Klinge Road valley, and the Patterson tract for parks. The necessity for the acquisition of these areas requires little comment from me. They are beautifully situated and mostly covered with magnificent trees, and are ideal for park purposes. Improvements, however, are encroaching so rapidly upon Piney Branch parkway and Klinge Road valley that if some action is not taken at once to acquire them, they will be lost as parks. I know of no link in the chain of parks in the District of Columbia so important as the Klinge Road valley. This is at present covered with the most beautiful trees in the entire District; besides it will connect Potomac Park and the Mall on the south with Rock Creek Park on the north, without passing through the Zoological Park. This park of necessity must have traffic restrictions; besides it is a playground for children, and should not be open to the continuous line of automobile traffic. If this link is acquired, it will complete the park system from the extreme south end of Potomac Park to the north end of Rock Creek Park, which is the north end of the District, making one of the most beautiful chains of parks in any

city of the country. Buildings are fast being erected across this link, and I have no hesitancy in saying that if this is not acquired within a very short time it will be lost as a park.

The enactment of legislation for the acquisition of the Civil War forts and the fort drive connecting the fort sites, is a matter that should be seriously considered at this time. There are some 40 forts and batteries on the District side of the Potomac River which formed the defenses of Washington, and they are of historic interest. Some of them have been destroyed by the progress of improvements, while many of them remain. Their acquisition, with a connection by a fort drive, would form one of the most magnificent boulevards encircling the city on heights which would give a wonderful panoramic view of the city, the Potomac River, the Anacostia River, and the hills of Virginia. No drive could be constructed in the District which would have the historic and sentimental interest, and besides providing a beautiful boulevard that would connect all parts of the District. In this chain Fort Davis and Fort Dupont have already been acquired, but this is a very small beginning.

I wish to call your attention to a matter that seems to me could be developed into one of the most beneficial improvements without such a tremendous outlay of cost that I can think of. It relates to the parking in front of residences in the District. This applies especially within the limits of the original city. These park areas are publicly owned, yet they are for the sole use and benefit of the adjoining property owner, who pays no rent or taxes upon the park area he enjoys. It is my belief that these areas could be regulated and beautified so as to add to the beauty of the city to a great degree. Especially do I have in mind the development of Sixteenth Street. There is 40 feet of public parking along each side of Sixteenth Street. This is occupied by the property owners, without any regard as to uniformity of treatment. There are some places where it is terraced and other places where it is on the grade of the sidewalk. There are some with fences and some without, some with hedges and some without, creating the most hodge-podge development that is possible. I know of nothing that would beautify Sixteenth Street so much as to have on both sides of the street a beautiful 40-foot parkway. It seems unreasonable to think that the Government owns this park area, and yet makes no effort to beautify it.

There are many ways this might be accomplished. It is believed that it would require legislation, which should provide for part or all of the cost to be borne by the property owners. Certain major streets could be developed at first, and the development could extend as there arose a demand, or the public interests required it. It seems unfair for one neighbor to keep a beautiful front yard to be marred by another neighbor who has no pride in its upkeep.

It is recommended that the commissioners take this matter under consideration at the earliest practicable date.

ALLEYS.

The law known as "the alley law," which provides for the elimination of all alley dwellings has been extended until June 30, 1923. The law, in other words, requires the vacation of all alley dwellings in the District by that time. This law has been extended from time

to time on the ground that it would be a hardship to deprive these ten or fifteen thousand people of their homes during the abnormal times that we have passed through the past few years. The question now arises, will the conditions be better at the expiration of this term of extension? Will it be any easier for these poor people to find new homes within their means? This office has always been opposed to the extension of this law, but rather in favor of having the law fundamentally amended. It is believed that if enforced it would create a great hardship upon these people. The fact that they are there, in many cases, is because they are not able to occupy better homes. This fact, however, will not shelter them after the expiration of this extension. I am not advocating that the alley dwellings should not be closed, but rather that the law be amended in many respects. These alley dwellings constitute a menace to the health and morals of the community and have been tolerated too long. They are breeding places for vice and crime, and provide hiding places for the "bootlegger." Perhaps 80 per cent of these alleys could be opened into minor streets, running through from street to street, and providing ample street facilities and ground at reasonable prices for the erection of small houses.

There are many other amendments to the law which, in the judgment of this office, might be made to an advantage.

The appropriation of \$1,000 for the purchase or condemnation of alleys or minor streets has been used to good advantage in the purchase of cut-offs where alleys were found too narrow to accommodate traffic. This also will be continued as such cases are brought to the attention of this office.

PERMANENT SYSTEM OF HIGHWAYS.

The \$2,000 appropriated for marking permanently upon the ground the highway plan for the District of Columbia has been expended in connection with locating many of the highway streets upon the ground and marking the same permanently. About 300 stone monuments about 3 feet long have been planted at various block corners. This will assist in making surveys in cases where these monuments have been planted.

This work will be carried on as the appropriation becomes available.

SALARIES.

I wish again to emphasize, with as much force as possible, the importance of not only increasing the number of employees of this office, but increasing the pay of the men. There are chainmen doing very accurate and responsible work in this office getting as low as \$650 per annum, basic pay. It is difficult to understand how we are able to get men at all at such a rate of pay. It is impossible to secure experienced men, and the responsibility of this work is such that only experienced and competent men should be employed. As previously stated in this report the work has so greatly increased that it is impossible to render prompt and efficient service with the present force.

I wish to call your attention to the appropriation of \$7,000 for the per diem employees in this office. In accordance with instructions

from Major Brown, with the approval of the engineer commissioner, the present force was retained after the 1st of July, with the information that the appropriation would only carry the force for about seven months of the present fiscal year. This was done with the understanding that effort would be made to provide a deficiency appropriation. I wish to state that if this policy is pursued, and the appropriation should not be secured, it would be a very serious matter for a number of the employees paid from that appropriation. Some of these men have been in this office over 25 years, have given their life to this work, and know no other, and it would be a very serious matter to them, and at the same time the public could not be served. I wish to go on record in this matter.

There has been no increase in the number of employees in this office for over 15 years, and with the great increase of work it makes it absolutely impossible to take up work incident to the proper development of the street, park, and alley plans for the District.

I wish to acknowledge the credit due the older men of this office for the service they are rendering. They have become efficient in their line of work, and should be rewarded. Over 50 per cent of the employees of this office are drawing less than \$1,000 per annum, and I do not believe there is another department in the District or Federal Government whose level of pay is as low as it is in this office. We were instructed to recommend a scale of wages for the employees of this office for the fiscal year ending June 30, 1924, and those instructions were carried out; but it is believed in many cases it is not enough for some of the men who are engaged in the more responsible and technical work of this office.

Very respectfully,

MELVIN C. HAZEN,
Surveyor, District of Columbia.

ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF THE MUNICIPAL ARCHITECT.

WASHINGTON, August 15, 1922.

SIR: I have the honor to submit the thirteenth annual report of the office of the municipal architect for the fiscal year ended June 30, 1922.

The work of the municipal architect's office consists in the preparation of plans and specifications and general superintendence and inspection of the erection and repair of all municipal buildings, embracing schools, police stations, truck and engine houses, hospitals, public-convenience stations, and various municipal institutions.

The activities of the municipal architect's office are divided into three groups: The central office and drafting room, the repair shop, and the branch office at the workhouse and reformatory.

The central organization consists of a drafting force under the direction of technical assistants experienced in design, construction, and mechanical work. In addition to the work on all new buildings, this organization prepares plans and specifications for the remodeling and repair of existing buildings.

The repair shop consists of a supervisory and clerical force together with a working force composed of artisans in the various building trades. The function of this shop is to maintain the various municipally owned buildings in a first class state of repair.

The branch office at the workhouse and reformatory is under the immediate supervision of a constructing engineer, and the details of the operation of this office may be found in his report.

I wish to emphasize that the appropriation for the repairs to school buildings is inadequate. Many of the older buildings require new heating plants and painting, while others should be equipped with modern lighting facilities. With the appropriation for the last fiscal year, it was possible only to make urgent repairs.

As a rule, new construction and remodeling or alteration of old buildings, are done by contract, the principal exception being the new buildings at Lorton and Occoquan, Va., where considerable prison labor is utilized, supplemented by such additional skilled employees as are needed to direct and instruct the prisoners to advantage.

In June, 1921, Congress, recognizing the importance of relieving the congestion in the schools, appropriated \$1,544,000 for the erection of nine additional graded schools and two junior high schools, as well as for the purchase of certain school sites.

Because of the crowded condition of the schools, it was desired, if possible, to have these new buildings ready for occupancy by September, 1922. Owing to the inadequate force in the municipal architect's office to cope with this amount of work as well as the work that had to be done in connection with the construction of the Gallinger Hospital, the New Eastern High School, and other projects, it was necessary to engage the services of outside architects to prepare sketches and working drawings of the proposed school buildings, and the following architects were employed:

A. P. Clark, jr., Wheatley School; Donn & Deming, L. P. Wheat, Bell School; W. H. Fleming, Smothers School; Gregg & Leisenring, Buchanan School; Arthur B. Heaton, Eaton School; McNaughton & Robinson, Lincoln Park School; Murphy & Olmstead, Deanwood School; Delos Smith, Monroe School; Upman & Adams, Mott School.

These architects prepared only the structural plans and specifications. The plans and specifications for the heating and ventilating, plumbing and electrical work were prepared by the municipal architect, inspector of plumbing, and electrical engineer, respectively.

On November 8, 1921, a 4-room addition to the Monroe School was placed under contract. The remaining buildings authorized by this emergency legislation followed in rapid succession, with the exception of the Bell and Smothers Schools.

Owing to a change in the location of the Bell School, this building was not placed under contract until May 19, 1922.

With reference to the Smothers School, it was found upon opening proposals, that the lowest bid exceeded the appropriation and the project has been laid aside temporarily. Owing to the inaccessibility of the site, and the difficulty that would probably be experienced in getting supplies and mechanics to go so far out in the country when plenty of work was available in the city, the contractors were not willing to submit proposals on this building at the same cost as the schools previously contracted for within the city.

The price for most of the work done under the emergency appropriation averages about 34.9 cents per cubic foot. The Smothers School would have cost, on the basis of the bids submitted, 45 cents per cubic foot. Fortunately, the commissioners are authorized to treat the appropriations made under this emergency legislation as one fund, so that it may be possible to save sufficient money on other projects to enable the Smothers School to be placed under contract in the near future.

The building program, with respect to the graded schools, is now nearing completion, three schools have been accepted to date by the commissioners, namely, the Monroe, Deanwood, and Mott.

It is expected that practically all of the buildings now contracted for, with the exception of the Bell School, will be ready for occupancy at the opening of the school year. Considerable credit is due the various architects for the prompt and energetic manner in which the working drawings for the various schools were prepared, many of them setting aside all other work in their offices in order to expedite the school program so as to relieve the congestion in the schools at the earliest possible moment.

NEW CONSTRUCTION.

During the year the following buildings were under construction:

Gallinger Hospital, located on Massachusetts Avenue SE. between Nineteenth and Twentieth Streets. Contractual limit as fixed by Congress, \$1,500,000. Amount appropriated to date, \$1,500,000. Construction proceeded as follows: Psychopathic group of buildings: Contract executed September 24, 1920; completed December 15, 1921; cost, \$802,855; contractor, George E. Wyne. Excavations, foundations, substructures, and pipe tunnels for power house and domestic building: Contract executed May 19, 1921; completed November 2, 1921; cost, \$149,209; contractor, George E. Wyne. Underground sewerage and drainage system for psychopathic group: Contract executed May 2, 1921; completed July 30, 1921; cost, \$7,345; contractor, Standard Engineering Co. Electric lighting, power, and telephone wiring for psychopathic group: Contract executed April 16, 1921; completed November 21, 1921; cost, \$12,917; contractor, H. P. Foley Co. Two-pipe vacuum heating system for psychopathic group: Contract executed August 30, 1921; completed January 3, 1922; cost, \$51,192.96; contractor, Federal Heating Co. Complete ventilating system for psychopathic group: Contract executed June 30, 1921; completed September 9, 1921; cost, \$15,300; contractor, Standard Engineering Co. Complete plumbing system for psychopathic group: Contract executed July 19, 1921; completed September 24, 1921; cost, \$55,060; contractor, Standard Engineering Co. Construction of power house, radial brick stack, including plumbing, electrical, and mechanical equipment: Contract executed June 23, 1922; contract time will expire October 17, 1922; cost to date, \$104,796; contractor, M. B. Casey & Co. Electrical fixtures, etc.: Contract executed June 27, 1922; contract time will expire October 9, 1922; cost to date, \$4,493.67; contractor, O. R. Evans & Bro.

Phelps School, located on Vermont Avenue, between T and U Streets NW. Amount appropriated for remodeling, \$20,000. Con-

tract executed July 21, 1921; completed October 1, 1921; cost, \$19,146; contractor, H. S. Hatton Construction Corporation.

Monroe School, located on Columbia Road, between Georgia and Sherman Avenues NW. Amount appropriated, \$75,000. Contract executed November 8, 1921, for constructing a 4-room addition in the sum of \$74,640; expiration of contract time, May 3, 1922; cost to date, \$74,640. The blast system of heating and ventilating is used in this building. Contractor, M. Seretto. Cubic contents, 140,263 cubic feet. Cost per cubic foot, 35 cents.

Deanwood School, located at Whittingham and Lane Places NE., Deanwood, D. C. Contractual limitation for an 8-room building, \$190,000. Amount appropriated, \$190,000; work on 4-room addition was completed February 9, 1921; cost, \$51,527.64. Additional four rooms contracted for December 2, 1921, for \$94,700; expiration of contract time, July 21, 1922, extended to August 15, 1922, and will be completed within that time; cost to date, \$81,714. The direct-indirect system of heating and ventilating is used in this building. Cubic contents, 257,649 cubic feet. Cost per cubic foot, 36.7 cents. Contractor, Henry B. Davis.

Wheatley School, located at Montello Avenue and Neal Street NE. Contractual limit for addition, \$250,000. Amount appropriated, \$250,000. Contract executed December 9, 1921, for 12-room addition and alterations for the sum of \$206,194; expiration of contract time, August 6, 1922; work will probably be completed October 1, 1922; cost, \$206,694 to date. The blast system of heating and ventilating is used in this building. Cubic contents, 590,400 cubic feet. Cost per cubic foot, 34.9 cents. Contractor, Parsons & Hyman.

John Eaton School, located at Thirty-fourth and Lowell streets NW. Amount appropriated, \$140,000. Contract executed December 30, 1921, for an 8-room addition for the sum of \$116,400; expiration of contract time, August 6, 1922; will be completed about September 15, 1922; cost of work to date, \$116,650; contractor, M. Seretto. Contract for furnishing and installing mechanical equipment executed January 31, 1922; date of expiration, September 1, 1922; cost to date, \$22,185. Cubic contents, 421,000 cubic feet. Cost per cubic foot, 36.2 cents. Contractor, Federal Heating Co. The split system of heating and ventilating is used in this building.

Lucretia Mott School, located on W Street, between Third and Fourth Streets NW. Amount appropriated, \$140,000. Contract executed December 30, 1921, for an 8-room addition for the sum of \$120,500; expiration of contract time, August 12, 1922; work will probably be completed September 1, 1922; cost to date, \$131,696. Two steam boilers have been purchased for this building at a cost of \$1,565.57. The direct-indirect system of heating and ventilating is used in this building. Cubic contents, 331,400 cubic feet. Cost per cubic foot, 36.3 cents. Contractor, H. D. Watts Co.

New Eastern High School, located on East Capitol Street, between Seventeenth and Nineteenth Streets NE. Contractual limit for building, \$1,500,000. Appropriations have been made as follows: A balance of \$28,448.65 from the appropriation for purchase of site made available toward construction of building; \$300,000 appropriated by act of March 3, 1917; \$60,000 by act of June 5, 1920; \$240,000 by act of February 22, 1921; \$900,000 by act of June 29, 1922; and

\$250,000 for equipment by deficiency act of July 1, 1922. Contract was executed September 10, 1920, for work of making excavations for building; work completed, January 29, 1921; cost, \$41,011; contractor, George Hyman. Contract was executed January 28, 1921, for construction of foundations and substructure; work was completed November 15, 1921; cost, \$292,270; contractor, George Hyman. Contract executed November 9, 1921, for construction of superstructure in sum of \$959,700; work to date has cost \$950,106; expiration of contract time, November 9, 1922. The split system of heating and ventilating is used in this building. Cubic contents, 4,828,900 cubic feet. Cost per cubic foot, 26 cents plus. Contractor, George E. Wyne.

Lincoln Park School (Richard Kingsman School), located at southwest corner of Fourteenth and E Streets NE. Amount appropriated, \$140,000. Contract executed January 31, 1922, for 8-room building for the sum of \$98,500. Expiration, July 24, 1922. It is expected the building will be completed September 1, 1922. Cost to date, \$98,380. Contractor, M. Seretto. Contract for mechanical equipment executed January 13, 1922; expiration July 24, 1922; cost, \$22,950. It is expected the work will be completed by September 1, 1922. Contractor, Standard Engineering Co. The direct-indirect system of heating and ventilating is used in this building. Cubic contents, 253,570 cubic feet. Cost per cubic foot, 47.7 cents.

Buchanan School, located between Thirteenth and Fourteenth, D and E Streets SE. Amount appropriated, \$140,000. Contract executed February 24, 1922, for an 8-room addition for the sum of \$125,143. Contract expires September 6, 1922; work will probably be completed within contract time. Cost to date, \$125,187. The split system of heating and ventilating is used in this building. Cubic contents 634,340 cubic feet. Cost per cubic foot, 36.4 cents. Contractor, M. A. Long Co.

Southeastern branch library, Edward L. Tilton, of New York architect, located on Seventh Street between South Carolina Avenue and D Street SE. Amount donated for building by Carnegie Foundation, \$67,000. Contract for construction of this library building executed February 25, 1922, in sum of \$56,798.25. Expiration July 1, 1922. It is expected that the building will be completed October 1, 1922. Cost to date, \$57,234. Contractor, Arthur L. Smith & Co.

Building to replace Bell School, located on Second Street between D Street and Virginia Avenue SW. Amount appropriated, \$140,000. Contract executed May 19, 1922, for 8-room building in the sum of \$119,335. Expiration January 9, 1923. Cost to date, \$120,082. The split system of heating and ventilating is used in this building. Contractor, H. D. Watts Co. Cubic contents, 311,835 cubic feet. Cost per cubic foot, 38.3 cents.

Farmers' produce market, located on B Street between Tenth and Twelfth Streets NW. Contract for construction of south shelter to this market executed May 19, 1922, in the sum of \$4,096. Work completed July 17, 1922, at contract price. Contractor, W. E. Mooney.

Besides the preparation of plans and specifications for the above buildings, plans and specifications for about 40 other pieces of work, such as heating systems in engine houses, cell and other work in police

stations, repairs to heating systems in school buildings, etc., were prepared in this office, the contract prices therefor amounting to \$61,489.

The contracts entered into by this office for the fiscal year beginning July 1, 1921, and ending June 30, 1922, amounted to a total of \$2,334,055.

A comparison of the cost of municipal construction this year with that of the preceding year, based on cubage, is as follows: 1922, 31 to 33 cents per cubic foot (this year); 1921, 43 to 51 cents per cubic foot.

Buildings just prior to the war period were constructed at a cost of from 17 to 19 cents per cubic foot.

GENERAL.

The work done by the municipal architect's organization was carried on by the statutory personnel hereinafter enumerated, and an additional per diem personnel employed with the funds allotted this office for personal services, namely, \$38,340.87.

STATUTORY EMPLOYEES.

	Salary per annum.
Municipal architect.....	\$3,600.00
Engineering assistant.....	2,400.00
Heating engineer.....	2,000.00
Superintendent of construction.....	2,000.00
Chief draftsman.....	1,800.00
Draftsman.....	1,400.00
Draftsman.....	1,300.00
Clerk.....	1,200.00
Copyist.....	840.00
Driver.....	600.00

PER DIEM EMPLOYEES.

	Salary per diem.
4 draftsmen.....	\$5.00
2 draftsmen.....	6.00
1 copyist.....	3.00
1 stenographer.....	3.50
8 inspectors.....	\$5.00 to \$6.00

At this point I would invite attention to the fact that the salaries of the employees of the municipal architects are commensurate neither with the duties and responsibilities required nor comparable with the salaries paid for the same kind of work by similar offices in the Federal service. A separate report has been prepared on this latter comparison which it is hoped will be presented to the proper congressional committee in due time. Many of our most able employees are leaving the District service for positions elsewhere, which would be more to their financial advantage. The present hope is that adequate personnel can be secured from time to time to carry on the necessary work.

I would suggest in connection with the organization of the municipal architect's office and the repair shop that consideration be given to a plan submitted in a former note, namely, that only such positions as should be considered permanent be placed upon the statutory roll and that all other positions in the office be put upon a per diem or temporary basis.

I consider the following positions should be permanent: Structural engineer, mechanical engineer, chief draftsman, superintendent of construction, superintendent of repairs, clerk.

I would recommend that a new position, that of assistant to the municipal architect, be established. The duties of all but the last position are well known and need not be defined further. The assistant to the municipal architect should be thoroughly conversant with the office work so that in case the municipal architect is not available the office work may go on without interruption. This would require a young man with a good architectural training and some executive ability.

In order to attract competent men for these positions, salaries commensurate with the character of the work to be done and at least equal to those paid in similar positions in departments of the Federal Government should be paid.

In my judgment they should be as follows:

	Minimum.	Maximum.
Structural engineer.....	\$3,300	\$3,600
Mechanical engineer.....	2,700	3,000
Chief draftsman.....	2,700	3,000
Superintendent of construction.....	2,700	3,000
Superintendent of repairs.....	2,700	3,000
Assistant to municipal architect.....	2,000	2,500

All other employees in the municipal architect's office and the repair shop, in my judgment, should be per diem employees whose services may be obtained from time to time as the office and shop work demanded.

This scheme would maintain a skeleton organization of permanent employees capable of directing an expansion of the activities of the office on short notice, and at the same time permit of an increase or decrease of the larger part of the office and shop employees at will.

It is my judgment that these per diem employees should be paid from a fund based on a percentage of the cost of the volume of work to be done. Outside architects receive a commission of 6 per cent for the preparation of plans, specifications, detail drawings, and superintendence. In a well-organized office the work of the architect can be done, including overhead, materials, and draftsman hire, for slightly more than 50 per cent of the commission. This would leave between $2\frac{1}{2}$ and 3 per cent profit. I would therefore suggest that future allotments of money to the municipal architect's office for the payment of drafting service be made on this basis and that a sum of money equal to 3 per cent of the total cost of the building be set aside for this purpose.

This method of procedure I believe is based on sound common sense and would place at the disposal of the municipal architect a sufficient sum of money to hire the necessary assistants to complete satisfactorily any building program undertaken by the District of Columbia.

A. L. HARRIS,
Municipal Architect

To the ASSISTANT TO ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT OF REPAIRS.

WASHINGTON, August 15, 1922.

SIR: I have the honor to forward herewith my annual report showing the operations of this shop during the fiscal year ended June 30, 1922.

There was appropriated by Congress:

Public schools, repairs to buildings, \$225,000; all of which was spent except \$167.16, reserved for any small bills that might come in after the close of the year.

Repairs to engine houses, \$20,000; all expended.

Repairs to police stations, \$8,000; all expended except \$23.41.

Repairs to police court, \$3,000; all expended except \$47.43.

The foregoing amounts represent the actual cost of 4,783 separate jobs.

In addition to the work covered by the above appropriations (which are under the supervision of the superintendent of repairs), this shop did \$74,461.02 worth of work on various buildings belonging to the District of Columbia out of appropriations controlled by other departments.

There were also inspected and repaired steam boilers in 89 buildings owned by the District.

The shop organization is composed of 5 annual employees, provided for by Congress, of 1 superintendent of repairs, at \$1,800 per year; 1 assistant superintendent of repairs, at \$1,350 per year; 1 clerk, at \$1,050 per year; 1 clerk, at \$1,000 per year; 1 clerk, at \$720 per year; and from 115 to 225 employees on the per diem roll, artisans of various trades as well as skilled and unskilled laborers, their number and kind depending entirely on the time of the year and the work in hand. The greatest number employed is usually during school vacation, when work can be handled to best advantage.

Special attention is called to the following:

1. That a very large number of window lights are broken during vacation period.
2. That 27 buildings have very antiquated and unsatisfactory heating plants.
3. That 114 of the 153 permanent school buildings have no or insufficient artificial lighting.
4. That 4 schools still use an outside shed-type toilet.
5. That playground space is very limited about many schools.
6. That no standard material for surfacing of playgrounds has been adopted; urging the adoption after much experimentation of the cinder-sand material successfully used by the shop.
7. That considerable "fire hazard" still exists about many schools (flammable materials in construction).
8. That there is not sufficient or adequate transportation, especially for foremen.
9. That the estimated cost of repairs is three times the amount of appropriation.

We have followed the practice of the last few years in compiling this report. Should more detailed information be desired, we can furnish a detailed statement of the cost of every job, or we can furnish

the expenditures under each class of work upon each and every building.

HENRY STOREY,

Superintendent of Repairs, District of Columbia.

To the MUNICIPAL ARCHITECT.

REPORT OF CONSTRUCTING ENGINEER AT DISTRICT OF COLUMBIA
WORKHOUSE AND REFORMATORY.

LORTON, VA., *October 5, 1922.*

SIR: I have the honor to submit herewith report of the operations of the construction division of the workhouse and reformatory for the fiscal year ended June 30, 1922.

This report includes a description and an account of the work under the supervision of the constructing engineer with cost statement of such work.

At Lorton, Va., just southwest of the present temporary buildings of the reformatory, it is proposed to construct 27 permanent buildings, as follows: 12 dormitories, 4 disciplinary dormitories, 5 shop buildings, 2 bathhouses, 1 dining room, kitchen, and bakery combined, 1 trade-school building, 1 assembly hall or auditorium, and 1 administration building.

At the beginning of the fiscal year 1921-22 the status of the work according to office records was as follows:

Dormitory, building No. 15.—Brick walls about 5 feet above footing.

Disciplinary dormitory, building No. 18.—Complete except for concrete floor and interior finishing.

Disciplinary dormitory, building No. 17.—Roof being put on.

Shop, building No. 19.—Brickwork about 12 feet above basement floor, forms in place, and reinforcing steel laid for reinforced-concrete floor of shop.

Shop, building No. 20.—Brickwork about 12 feet above basement floor to line of main floor.

Main sewers.—About 50 per cent complete.

During the fiscal year the following work was done:

Dormitory, building, No. 14.—Foundation partly completed.

Dormitory, building No. 15.—Brick walls raised about 3 feet all around.

Disciplinary dormitory, building No. 17.—Roof completed, sash hung and painted, iron grills placed at windows, cells partly bricked in, metal ceiling installed, steel cell fronts ordered.

Disciplinary dormitory, building No. 18.—Concrete floor laid and some plumbing fixtures installed.

Shop, building No. 19.—Reinforced-concrete floor laid and building completed except for heating system and electric lights on upper floor. Basement put in service as automobile garage and repair shop.

Shop, building No. 20.—Reinforced concrete floor completed. Brickwork complete and work started placing roof trusses in position.

Shop, building No. 21.—Concrete footings placed.

Heating tunnel.—A section approximately 160 feet long near shop buildings completed.

Area at site of buildings Nos. 21 to 23 graded; approximately 3,000 cubic yards of earth moved.

During the coming year it is proposed to complete as far as possible the 5 shop buildings, 2 dormitories, 2 disciplinary dormitories, 1 bathhouse, and remodel the present boiler house, after which new work will be continued along the line of dormitories adjacent to those now under construction. Grading work will be done whenever the laborers can be spared from the actual building construction.

The work of constructing these buildings is done by hired mechanics and prisoners in accordance with the following plan:

A hired mechanic is placed in charge of a working squad consisting of a number of prisoners. He works with the prisoners and instructs them in the work. There are squads for brickwork, carpenter work, concrete work, excavating, etc. The number of prisoners in these squads varies from time to time with the nature of the work and with the total number that is assigned to construction work from the institution.

An industrial railroad is being built from the wharf at Occoquan Creek extending to the workhouse and reformatory buildings with a proposed connection with the Richmond, Fredericksburg & Potomac Railroad near Pohick Station. That section of the road between the wharf and the workhouse buildings is completed and has been in operation since July, 1920. The grading of the roadbed between the workhouse and reformatory is now in progress. Previous to July 1, 1921, a section of the roadbed had been cut to grade from Giles Run to a point just west of the present reformatory buildings, a distance of approximately 2,500 feet. During the year 1,800 feet of roadbed was graded, extending south from Giles Run toward the workhouse buildings, by reformatory prisoners. Grading was started over a section about 300 feet long just north of the workhouse buildings by workhouse prisoners. With an adequate force of men kept at this work and contingent upon other conditions being favorable, this railroad should be in operation between the workhouse and reformatory within 18 months. A great effort is being made by the construction department to complete this section of the railroad.

Central power plant.—This plant is located on Occoquan Creek near the workhouse brickyard. It will furnish electric current for light and power for the reformatory and workhouse. An ice plant is also installed in part of this building. During the past fiscal year a large generator set was installed and tested with piping and other equipment and preparations were made in June, 1922, to put this plant in operation. During the coming year it is proposed to move a generator from the work house plant and an air compressor from the old pumping station to this plant. It is also planned to place ice plant in operation.

A new electric-driven centrifugal pump will be installed in the pumping station and plans and estimates prepared for constructing a filtration plant and other improvements to the water system.

Temporary buildings at workhouse.—The eight temporary buildings constituting the main group of workhouse buildings near Occo-

quan, Va., are becoming very dilapidated and new permanent buildings are urgently needed.

During the past fiscal year very little permanent construction was done at this institution because of insufficient funds and the necessity of performing considerable repair work on existing buildings. In addition to the repair of existing structures one two-family brick cottage was completed, consisting mostly of interior finishing and concrete walks; a railroad trestle about 200 feet long, for dumping coal in storage, was constructed; and three wells for drinking water were dug at the following places: Near tailor shop at male department; near female department laundry; at residence of the superintendent of brick plant.

During the coming year it is proposed to begin construction of permanent buildings at this institution provided sufficient funds are available. Preliminary plans for this work have been prepared.

The tables below give the cost of each job of construction taken from cost of hired labor actually on each job and from cost of material requisitioned for each job, as has been reported in previous annual reports. The total expenditures from the appropriation for hired labor, bought materials, etc., may be obtained from the records of the reformatory and workhouse.

Work at the District of Columbia Reformatory.

Title.	Fiscal year 1922.					Cost previously reported June 30, 1921.	Total chargeable to the appropriation from beginning of work to June 30, 1922.
	Number days prison labor.	Number brick.	Cubic yards sand and gravel.	Paid labor.	Bought material.		
Permanent construction:							
Permanent buildings.	10,620	370,050	745	\$7,794.72	\$10,298.44	\$21,027.47	\$39,120.63
Railroad.	2,158	80,000	70	1,865.59	2,271.59	18,523.22	22,660.40
Locomotive house.						697.55	697.55
Totten House.	358	1,000		273.18		1,562.53	1,835.71
Pollock House.				(1)		3,310.10	3,310.10
Officer's residence No. 1.						2,899.83	2,899.83
Physician's residence.				(1)	149.15	13,420.89	13,570.04
Chief clerk's residence.	231			153.45	222.29	2,267.14	2,642.88
Hog pens.	914			24.70	161.12	352.88	538.70
Construction engineer, truck.					14.69	1,057.32	1,072.01
Total chargeable to permanent construction.							88,347.85
Construction and repair for administration and upkeep:							
Temporary buildings.	2,553	3,000		2,360.56	3,716.57	4,230.10	10,307.23
Central power plant.				1,566.97	12,521.72	50,664.51	64,753.20

¹ See District of Columbia Workhouse.

Work at the District of Columbia Workhouse.

Title.	Expended during fiscal year 1922.					Cost previously reported, June 30, 1921.	Total chargeable to the appropriation from beginning of work to June 30, 1922.
	Number days prison labor.	Number of brick.	Cubic yards of sand and gravel.	Paid labor.	Bought material.		
Central power plant.....	1,292	3,750	170	\$171.97	\$8.52	\$231.16	3,411.65
Two family cottage.....	623	1,000	18	681.73	700.57	4,696.82	6,079.12
Locomotive house.....				(1)		1,337.95	1,337.95
Repairs at brickyard.....	207			368.13	1,179.99	3,447.71	4,995.83
Superintendent residence.....	160			443.43	272.23	970.64	1,686.30
Physician's residence.....	76			152.74	14.17	261.15	428.06
Tug Louise.....						658.94	658.94
Ninth Street wharf.....	10			36.10	65.97	1,014.58	1,116.65
Work at shipyard.....	405			602.93	49.08	4,804.19	5,456.20
Railroad trestle, etc.....	1,416	36,000	15	735.45	213.96	3,297.84	4,247.25
Assistant superintendent residence.....	83			217.13	271.37	422.82	911.32
Fruit cellar.....	40	4,150		56.00	141.80	1,275.31	1,473.11
Female department.....	277	2,400		422.19	443.41	646.79	1,512.39
Pollock house.....	25			68.68		98.68	167.36
New scale house.....	214	13,600		333.09	120.24		453.33
Total.....							30,935.46

¹ See D. C. R.

CONSTRUCTION AND REPAIR FOR ADMINISTRATION AND UPKEEP.

Temporary buildings.....	4,768	14,350	15	8,340.18	2,307.90	\$13,113.78	\$23,761.56
Construction engineer truck.....					20.84		20.84
Total.....							23,782.70

Total chargeable to the appropriations this year, \$54,718.16.

Respectfully submitted.

HERBERT R. HAAR,
Constructing Engineer.

The MUNICIPAL ARCHITECT.

REPORT OF THE INSPECTOR OF BUILDINGS.

WASHINGTON, July 31, 1922.

Sir: I submit herewith annual report covering the transactions of the building division during the fiscal year ended June 30, 1922.

No report of Federal Government operations has been received during the year.

Statement of permits issued from July 1, 1921 to June 30, 1922.

	Number.	Value.		Number.	Value.
Brick:			Hollow tile—continued.		
Repairs.....	1,926	\$3,263,343	Shop.....	2	\$2,700
Dwellings.....	1,532	11,564,140	Stores.....	2	2,390
Apartments.....	60	7,546,500	Cafeteria.....	1	13,000
Stores.....	112	555,300	Sheds.....	6	2,075
Warehouses.....	8	108,400	Office.....	1	200
Garages.....	689	678,593	Warehouses.....	2	2,000
Bakery.....	1	3,500	Concrete:		
Banks.....	4	505,000	Dwellings.....	7	22,130
Chapels.....	2	310,000	Garages.....	96	167,912
Churches.....	4	516,550	Metal:		
Clubhouse.....	1	80,000	Garages.....	1,724	365,868
Fairy.....	1	32,000	Sheds.....	27	5,190
Dry-cleaning plant.....	2	15,000	Gas holder.....	1	50,000
Factory.....	1	30,000	Frame:		
Film exchange.....	1	100,000	Sheds.....	385	34,491
Hospital.....	1	8,400	Repairs.....	742	251,071
Ice plant.....	2	75,000	Dwellings.....	839	4,634,318
Hotels.....	2	1,953,350	Garages.....	246	74,443
Market.....	1	100,000	Office.....	1	500
Manufacturing plant.....	1	80,000	Churches.....	2	39,247
Monastery.....	1	14,000	Ice box.....	1	1,500
Office buildings.....	7	1,385,560	Cafe.....	1	1,000
Offices.....	4	9,400	Stores.....	2	500
Oil storage tanks.....	1	10,000	Dormitory.....	1	5,000
Schools.....	2	71,000	Machinery:		
Sunday school.....	1	23,000	Elevators.....	76	311,075
Sheds.....	4	9,800	Motors.....	336	191,598
Storage buildings.....	4	159,000	Pressing machines.....	3	700
Store and dwellings.....	18	322,500			
Store and flat.....	1	25,000	Total.....	9,174	36,197,059
Theaters.....	2	140,000	Awnings.....	120	9,000
Hollow tile:			Signs.....	1,703	17,030
Dwellings.....	19	269,180			
Garages.....	59	34,010	Grand total.....	10,967	36,223,089
Repairs.....	2	20,825			

The following summary shows the distribution of improvements in the respective sections of the District and the values of same:

	Buildings.	Repairs, etc.
Northeast.....	\$184,734	\$187,049
Southeast.....	740,331	148,477
Northwest.....	7,323,738	2,369,177
Southwest.....	17,035	128,975
County.....	23,109,257	1,684,976
Total.....	31,678,105	4,518,95
	4,518,954	
Sum total ¹	36,197,059	

¹ Does not include awnings or signs, the values of which are estimated.

Grand total for all building operations, \$36,223,089.

Comparative statement for years 1921 and 1922.

	New Buildings.	Repairs, etc.	Dwellings.	Apartments.	Business Buildings.
1922.....	3,510	5,664	2,397	60	1,053
1921.....	1,605	5,323	772	14	819
Increase.....	1,905	341	1,625	46	234

Valuation of building operations, including awnings and signs:

1922.....	\$36,223,089
1921.....	19,025,291
Increase.....	17,197,798

Permits issued, number of, including awnings and signs:

1922.....	10,301
1921.....	8,310
Increase.....	1,991

Estimated number of buildings in the District of Columbia.

	Brick.	Tile.	Concrete.	Stone.	Frame.
1922, erected.....	2,470	91	103	000	846
1922, razed.....	84				138
1921.....	2,386	91	103	000	708
	69,260	269	109	2	27,388
Total estimated number standing....	71,646	360	212	2	28,046

During this period there were issued 3,002 conforming certificates of occupancy and 295 nonconforming certificates, the fees therefor totaling \$3,305.50.

A comparison of the foregoing tabulation with the reports of previous years shows an increase in the value and volume of operations in excess of the yearly average covering the entire history of the department, even when the present high cost of materials and labor is taken into consideration. The increase over 1921, for example, in valuation was \$17,197,798, whereas the total yearly valuation of building operations for the past 15 years will average approximately \$9,000,000. This increase has, of course, added in a corresponding degree to the work of the office without any permanent increase in the number of employees. For the fiscal year 1923 there was an appropriation of \$20,000 made by Congress for the employment of temporary additional inspectors, following the recognition on the part of the public, as a result of the Knickerbocker Theater disaster, of the fact that the department was undermanned. But this relief fails to meet the necessities of the situation. While the full quota of employees which the appropriation justifies has been filled, there is no assurance that the staff will remain intact throughout the year. Indeed, experience indicates the contrary.

During 1922 three engineers resigned to accept more lucrative employment with engineering firms. Recently two experienced clerks withdrew from the service because of greater salary inducement elsewhere. The filling of these positions is difficult. In the case of engineers, it has been found that either promising men accept positions with the idea of gaining such practical experience as will enable them to make more advantageous connections outside, or experienced engineers decline to enter the service because only temporary employment may be promised. In the case of clerks the salaries are so meager that competent men frequently utilize the experience gained merely as a stepping-stone to more remunerative jobs.

Notwithstanding the handicaps under which the department has been compelled to operate, a recent survey has been made of all the theaters, public halls, etc., in the District, and, while no actually dangerous conditions have been found, those of the older buildings not in strict compliance with the present regulations are being so altered as to conform therewith, and the National and Poli Theaters are undergoing complete reconstruction, and, when finished, will meet in every respect the latest approved engineering standards of safety and security.

It is believed fitting to urge attention to the fact that the force of this office, except for the temporary employees referred to above, has not been augmented for years past. At the time of the Knickerbocker catastrophe the personnel consisted of the inspector of buildings, 13 assistant inspectors, a fire-escape inspector, 3 engineers or computers, a chief clerk, 4 underclerks, and a messenger, who also acted as chauffeur. The salary of the inspector was \$3,000 a year, that of the principal assistant was \$2,000; 2 assistants were paid \$1,500 each, 1 was paid \$1,400, and the remainder \$1,300 each. The salaries of the engineers were, respectively, \$2,000, \$1,800, and \$1,500. The fire-escape inspector's salary was \$1,400, and that of the chief clerk \$1,800, while the average pay of the underclerks was \$1,000.

These salaries are the same as now received.

Three of the assistants were, and are, assigned to the inspection of elevators, supervising the installation and making quarterly examinations thereafter with respect to the safety of operation. One assistant acts as an aid to the fire-escape inspector, leaving nine for inspection of general construction, etc.

With the growth of the District, the difficulty of efficient administration has become more and more pronounced, particularly since steel and concrete construction has become so prevalent, and the administration of the zoning regulations has been added to the duties of the office.

There has seemed to be a general misapprehension of the department's full scope—an impression that the issuance of permits and the inspection of buildings in the course of erection constitute the complete function of the office. The facts are that all plans must be examined by the engineers or computers to see that they comply with the building and zoning regulations as well as accord with approved engineering standards. Years ago, before building operations had assumed such proportions and when steel and concrete construction were comparatively undeveloped, the checking of plans could be accomplished approximately concurrently with their filing. Obviously, such dispatch is impossible now.

The engineers must also check radius or area plats which must be filed in connection with the consents of property owners to the establishment of garages, the installation of motors and similar apparatus.

The inspectors are required not only to inspect buildings of all classes during the course of erection, filing daily a record of the progress thereof, and seeing that the plans as approved are followed, but they must see that the materials used are of the standard laid down in the building code. In addition, they must respond to all complaints of the dangerous or depreciated condition of structures, and even party fences, to all reports of the police, fire, and health departments, or of the private citizen to the effect that buildings are being used for purposes prohibited by the regulations; and must serve notices of infractions of the building or zoning provisions.

This meant that, prior to the World War, each man was charged with the inspectional supervision of, conservatively, 350 "live" jobs, in addition to the miscellany embracing complaints, etc. As clearly demonstrated by the statistics for 1922, his labors have been increased at least 100 per cent.

The fire-escape inspector is required to see that all buildings of a public or quasi-public character, such as hotels, apartment houses,

theaters, etc., are equipped with fire escapes when required by law; and are provided with such fire extinguishers as are necessary to afford protection against fire hazard. Yearly inspections must also be made by this official to determine that the classes of buildings mentioned are in compliance with law, licenses for the conduct of such buildings being withheld by the license bureau until applications therefor have been approved by this department.

The fire-escape inspector is also charged with the duty of making frequent examinations to ascertain that there is no deterioration in equipment, that exits are kept clear of obstruction, and that the aisles in theaters and similar structures are not encroached upon by chairs or patrons.

The temporary addition to the force provided for 1923 has been assigned as follows: Four to assist the engineering or computing force; one to inspect steel or iron work exclusively; two as concrete inspectors; and three as general field inspectors. This distribution has already justified its conception, although made possible only since July. The arrangement enables the office to check plans more rapidly and to keep in constant touch with building operations of a major character, and thus protect the public to a degree heretofore impossible against the use of faulty materials and against lax or incompetent workmanship.

It is desired to stress the fact, however, that no matter how capable these employees may be, their employment being merely temporary can not fail of militating to some extent against efficiency of administration and may, perhaps, exercise an undesirable effect upon the morale of the organization; for it has been found necessary to compensate most of the temporary employees at a rate in excess of the salaries paid statutory men, many of whom have been in the service for years, although it can not be said that an average of \$6 a working day is an extravagant remuneration for the services performed.

It is desired, too, to emphasize the fact that, while this additional force will greatly aid in the dispatch of business, as well as in inspectional work, the lack of a relative increase in the clerical force places the office at a distinct disadvantage in the preparation and filing of its records and in the endeavor to serve the public in the matter of giving information, of expedition in handling applications, and of issuing building permits or certificates of occupancy under the zoning regulations.

The revision of the building code has been in process since November, 1921. The typed draft is now in shape to be submitted to the commissioners for their consideration.

In the work of revision the latest revised codes of several of the larger cities have been consulted, as well as the committee appointed by Secretary Hoover to prepare a standard building code; also the American Society for Testing Materials, and all other recognized standard authorities on building, building materials, and building codes.

In comparing the present building regulations with those of other cities of equal importance, I find that the District Code is conservative and comparable with the best. In the revision the endeavor has been to bring the code up to the best standards of practice for

safe and economical building construction. That this standard may be maintained, the department should be able to keep in close touch with the use of new materials, new methods of design, and to avail itself of conferences with the highest authorities. For the purpose of defraying the expense incidental to such investigations, it is urged that the sum of \$500 be provided.

There should be an additional appropriation also of \$1,200 for the maintenance of motor cars furnished by the owners in connection with inspectional work. Such an allowance would permit more frequent inspections and would at the same time prove financially economical, as the services of at least three inspectors could be dispensed with, provided the full number now engaged were placed upon the statutory roll.

The present extraordinary activity in building construction will not, it is believed, be indefinitely maintained, but its continuance through the next fiscal year, with perhaps some modifications, is predicted by those best advised. For this reason an appropriation of \$15,000 for the employment of temporary inspectors has been sought for the fiscal year 1924. Such a policy, however, can not prove satisfactory, for the stability of the force can not be assured. Even though the volume of operations now being conducted be admitted as abnormal, the steady and increasing growth of Washington is an unequivocal refutation of the idea that building construction will revert to a pre-war status. It is absolutely necessary, therefore, that the permanent force of this office be substantially increased in all departments, and that the salaries be raised to figures commensurate with the duties of the respective positions.

The function of this office is primarily to safeguard the public in the matter of building construction. The public has the right to assume that every place of public assembly is structurally adequate; the builder of a home is justified in depending upon this office to see that his house is erected in such a manner as will insure his safe occupancy; the patrons of a hotel, the tenants of an office building, properly rely upon the building inspection division to adopt and enforce such regulations as will guarantee integrity of construction. But while properly charged with responsibility to the extent indicated, the inspector of buildings should not be called upon to correct the design of a building the plans for which do not comply with the regulations. The standards of construction, based upon approved and thoroughly tested engineering practice, are prescribed by the building code. With these standards engineers and architects are supposed to be, and should be, conversant. Should the plans submitted, therefore, fail to meet the requirements it is not the duty of the inspector of buildings to make the necessary corrections; this is an obligation the architect assumes when he accepts the commission to prepare drawings. In brief, the inspector of buildings, by his approval of a submitted design, warrants the safety of the building when erected in accord therewith. But the province of his office ceases here. The architectural treatment is not within his purview. Indeed, from a strictly official viewpoint, he is not required to point out wherein a scheme presented for examination failed to meet the factors of safety laid down in the regulations. He fulfills his duty when he has by computation determined that such failure exists and so informs the applicant.

It should not be sought, in other words, to impose upon the inspector of buildings the discharge of an obligation clearly and specifically resting upon the architect or engineer. It is a fact, however, that such an unreasonable position is not infrequently taken. This may sometimes be due to a sincere misconception of the inspector's duties. Often, however, the endeavor has been made to tax this office with neglect when the truth is that derelictions should be laid at the door of the engineer or architect.

There are no qualifications prescribed by law which one must possess before practicing either of these professions with the result that commissions are at times accepted by those lacking the technical ability to fulfill their contracts.

The attempt is then made to ascribe to this office the responsibility for the resultant denial or the delay in the issuance of permits.

It is believed that the public, understanding conditions, will acknowledge the injustice of demanding of the building inspection division of the Washington of to-day an irreproachable administration when it is realized that the division has at its command the same statutory force, receiving the same grossly inadequate salaries, as obtained 20 years ago.

With a staff of employees reasonably required by the duties devolving upon the office, and with a schedule of salaries reasonably compensatory, it is felt that the public will have no just cause of complaint to lodge against this bureau of the municipal government.

Inspection of boilers.

Boilers inspected.....	470
Boilers inspected for the District of Columbia (no fee).....	36
Boilers condemned as unfit for further use.....	12
Cases of scale and deposit.....	52
Cases of defective setting.....	22
Cases of defective steam gauges.....	10
Cases of defective tubes.....	75
Cases of defective steel plates.....	25
Cases of working pressure reduced.....	12
Total amount received.....	\$2,350
Total amount expended.....	370

Compensation of inspector..... 1,980

Very respectfully,

JOHN P. HEALY,
Inspector of Buildings.

ASSISTANT TO ENGINEER COMMISSIONER.

REPORT OF THE PERMIT CLERK, ENGINEER DEPARTMENT.

WASHINGTON, August 1, 1922.

SIR: I have the honor to submit the following report of the permit clerk's office, giving the number of permits issued during the fiscal year ended June 30, 1922:

Water connections.....	2,317
Repairs.....	744
Specials (no fee).....	121
Sewer connections.....	2,361
Repairs.....	690
Specials (no fee).....	981

Gas mains and connections.....	2,531
Repairs.....	304
Specials (no fee).....	11
Electric construction, underground connections.....	2,425
Repairs.....	77
Specials (no fee).....	12
Conduits.....	419
Manholes.....	224
Automobile air pipe lines and private conduits.....	11
Fences to inclose parkings.....	431
Guard stones in alleys.....	12
Poles—erect, replace, and remove.....	996
Miscellaneous.....	44
	14,711
Permits for various kinds of work in public space.....	3,995

Total permits issued..... 18,706

Fees of \$1 each were paid for 13,586 and permits for which no fees were paid 5,120.

Record cards were made of all files referred to this office, permits issued or reports made and the files returned to the various divisions having supervision of the inspections of work for which permits were issued.

Applications for permits were filed according to location and report of excavations in public space were made to the engineer of highways for necessary repairs.

Very respectfully,

H. M. WOODWARD,
Permit Clerk.

To the INSPECTOR OF BUILDINGS.

REPORT OF BOARD OF EXAMINERS OF STEAM ENGINEERS.

WASHINGTON, D. C., *September 7, 1922.*

To the COMMISSIONERS OF THE DISTRICT OF COLUMBIA.

SIRS: The board of examiners of steam engineers have the honor to submit to you the report for the year ended June 30, 1922. The following table shows the work as it progressed during each month:

	Meet- ings held.	Appli- cants re- ceived.	Appli- cants ap- proved.	Appli- cants not compe- tent.	First class.	Second class.	Third class.	Gas fired for pres- sing ma- chines.	Special class.
1921.									
July.....	5	44	33	11	2	0	4	27	0
August.....	4	30	20	10	1	1	3	16	2
September.....	5	22	13	9	1	1	7	2	2
October.....	4	26	18	8	3	0	3	11	1
November.....	4	14	8	6	1	0	3	3	1
December.....	5	23	11	12	0	0	2	6	3
1922.									
January.....	4	8	8	9	2	0	1	5	2
February.....	4	39	30	11	0	0	3	23	2
March.....	5	20	9	4	0	0	5	3	1
April.....	4	13	9	6	0	0	2	2	5
May.....	4	12	6	6	0	0	1	3	2
June.....	6	11	7	4	0	0	3	4	0
Total.....	54	262	172	90	9	2	37	105	19

Our estimate of expenses for the year ending June, 1914, has been submitted to the secretary, Board of Commissioners. We most respectfully ask that the amounts set forth be appropriated.

Respectfully submitted,

E. F. VERMILLION,

H. BOESCH,

WM. T. EVANS,

Board of Examiners of Steam Engineers.

REPORT OF THE INSPECTOR OF PLUMBING.

WASHINGTON, D. C., *September 1, 1922.*

SIR: I am submitting herewith the fortieth annual report of the plumbing inspection division of the engineer department:

During the last year there were 18,384 inspections of plumbing work in new buildings; 7,539 inspections of plumbing work in old buildings; 12,085 inspections in connection with complaints made of condition of plumbing and guttering and spouting in old buildings; making a total of 38,008 plumbing inspections made by the general field force of the office. In addition to this there were 1,037 inspections made of District or United States Government work, and 2,680 special inspections or visits made by the head of the office, the principal assistant, and the head of the complaint division, in connection with appeals from the District inspectors, police court cases, conferences with witnesses of illegal plumbing installation, etc., making a total of 41,725 inspections made by the office during the year.

This is 25 less than the total number of inspections made during the last fiscal year, but by reason of the building up of the suburbs this number of inspections occasioned really more work for the field and office force than last year. The total number of inspections made by the field force, divided by the actual number of days on duty, shows that the average work was nearly 14 inspections per man per day. The largest number of inspections in any one day was 32.

OFFICE WORK.

The amount of work performed by the office force was greater this year than ever before, a total of practically 34,000 separate and distinct operations, such as writing of letters and indorsements, preparation of notices, etc., being accomplished.

COMPLAINTS.

It is interesting to note that practically one-third of all the inspections made by the field force, and more than one-half of all of the operations of the clerical force were caused by complaints of insanitary plumbing in old houses or defective down spouts and gutters. This is of course somewhat a temporary phase, due to the present housing conditions.

REGULATIONS.

During the year there were no changes of consequence in the plumbing regulations, but several are contemplated which may materially reduce the cost of plumbing to the householders and at the same time tend toward the improvement in the general sanitary condition of the District.

POLICE COURT CASES.

During the year it was necessary to obtain 39 warrants, 18 for violation of the plumbing regulations by householders and 21 against unlicensed plumbers doing improper work. Sixteen of these cases were disposed of by reason of compliance with the regulations; fines were obtained in 18 cases; personal bonds were taken in 3 cases on promise to comply with the requirements of the office; and but 2 of the entire 39 cases were dismissed by the court for lack of evidence. The total amount collected from fines in the 18 cases was \$385.

COMPULSORY DRAINAGE.

During the last fiscal year 275 cases of sewer and water connections and other plumbing work were referred to this office by the health office and other divisions of the District government for prosecution under the terms of the drainage act and the nuisance act, the cost of which was to be assessed against the property. In a very great many of these cases the required repairs were made by the agent or owner after the proper notice and there remained but 45 cases where this office finally had to do the work and assess the cost. At the close of the fiscal year there were still pending in this office 30 cases which could not be immediately prosecuted, by reason of legal questions, questions of ownership, etc., and there are 11 cases still under notice.

PLUMBING BOARD.

The plumbing board held 24 meetings and examined 66 applicants, of whom 11 passed and were granted license, so that at the close of the fiscal year there were 238 registered master plumbers in the District, about 190 of them being actively engaged in business. There were also 8 registered gasfitters.

PUBLIC CONVENIENCE STATIONS.

There were in operation throughout the year four convenience stations, open from 6 a. m. until midnight, with two shifts of attendants, each working nine hours per day. The largest station, that at Seventh Street and Pennsylvania Avenue NW., accommodated 8,581,984 persons; that at Thirteen-and-a-half Street and Pennsylvania Avenue NW., 2,570,580; that at Ninth and K Streets NW., 2,420,648; and that at Fifteenth and H Streets NE., 137,204, making a total patronage of these four stations of over 13,000,000 users during the fiscal year. The records show that the women used the stations a little over one-eighth as much as the men and contributed about one-tenth of the receipts. The cash receipts for the year amounted to \$9,377.03, and consisted of 5-cent fees received for use

of pay toilets, rental of clean towels at 2 cents each, commissions received on telephone service, bootblack stands, etc., being about 42 per cent of the actual cost of operation of the stations. In the several cities exchanging records with this office, some have no receipts at all, by reason of the fact that they have no pay compartments or other facilities for which charge is made, and those cities which do have facilities and charge therefor average about 15 per cent of the cost of operation in their receipts. I do believe this showing is due to the general excellence of our stations, the service we give in our pay compartments, and the use of a coin-lock system of recognized standard. The need for new stations is being continually pointed out, and it is recommended that an effort be made to add to the number of stations in the business section.

SALARIES.

During the last year this office has lost several men by reason of inadequate salaries, and it is most earnestly recommended that an unusual effort be made to obtain salaries for these technical men more commensurate with their duties. In consideration of the efficient and faithful service rendered by the men in this office, I commend them to you for your most earnest consideration.

Very respectfully,

A. R. MCGONEGAL,
Inspector of Plumbing.

The INSPECTOR OF BUILDINGS.

REPORT OF ASSISTANT ENGINEER COMMISSIONER WOOD.

WASHINGTON, D. C., *September 15, 1922.*

SIR: I have the honor to transmit herewith the annual reports of the operations of the various divisions and offices under my immediate supervision for the fiscal year ended June 30, 1922.

Very respectfully,

JOHN E. WOOD,
Captain, Corps of Engineers, United States Army,
Assistant to the Engineer Commissioner.

The ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT OF THE WATER DEPARTMENT.

WASHINGTON, *August 30, 1922.*

SIR: The annual report of the water department for the fiscal year ended June 30, 1922, is submitted herewith.

The total length of mains laid during the fiscal year was 61,862 feet, this being 11.7 miles, which is an increase of $3\frac{1}{2}$ miles over the amount laid during the fiscal year ended June 30, 1921. Total length of mains in service is 659.2 miles.

The mean daily total consumption for the fiscal year is 63,309,230 gallons, making the mean daily per capita consumption 140.68 gallons, estimated on a population of 450,000, being practically the

same as last year when the population was 437,571, though the mean daily total consumption is about 1,800,000 gallons above the same item last year.

The department has invited attention to the excessive use of water in quite a number of Government buildings but has not been very successful in securing a reduction to any appreciable extent in the quantities used.

The large fountains in the District of Columbia at very little expense could be equipped with electrically-controlled motor-driven pumps and filtered water could be used over and over again by means of these pumps with very little waste. There is no question in my mind but that these fountains would add greatly to the enjoyment of the public if some means, as suggested, could be used to place them in operation.

There are a number of places in buildings under control of both the Federal and District Governments where a more careful observation and supervision of the use of filtered water would be the means of eliminating much waste.

The department has under investigation the question of a high-pressure fire service for the business section bounded, roughly speaking, by First and Eighteenth, B and H Streets NW. Up to the present time our investigation of this matter is not in such shape as to allow a full report on same, but in a short time the department will be in a position to submit a report with an estimate of cost of the installation of this fire service; the idea being to build a pumping station at the foot of about Twelfth or Thirteenth Street, using electrically driven centrifugal pumps giving a discharge pressure of between 125 and 300 pounds over the area above mentioned.

In my opinion the most important main laid during the fiscal year was the 12-inch one in Sixteenth Street between I and U Streets NW. This main passes through a very important section where large apartments and residences were formerly supplied by 4-inch and 6-inch mains, these smaller mains being removed at the time of the laying of the 12-inch.

The department has under consideration the extension of pump service in the vicinity of the high points along Bennings Road east of the Anacostia River. A project for this extension will be forwarded shortly and will assist greatly in securing better service for this territory. Necessarily the scope of this extension can not be very extensive owing to restricted storage capacity in this area.

Attention is invited to the question of the disposal of valuable real estate, situated in square No. 175, now owned by this department. This property is in the block bounded by Sixteenth and Seventeenth, U and V Streets NW., and represents an investment of \$66,500. This property is no longer used or needed by the water department, but is used by other departments of the District government. If sold, as suggested, the sum obtained could be used to advantage in making needed extensions of the distribution system.

I wish to record my appreciation of the work done by the employees of this department.

J. S. GARLAND,
Superintendent, Water Department, D. C.

ASSISTANT TO THE ENGINEER COMMISSIONER.

ENGINEERING AND CONSTRUCTION.

A 16-inch water main was laid in Upshur Street between New Hampshire Avenue and Rock Creek Church Road NW. The laying of this main gives an adequate supply of water to the Soldiers' Home for fire protection, as well as a supplemental supply for domestic purposes adjacent thereto.

A 16-inch water main was laid in Kennedy Street between Illinois Avenue and Fourteenth Street NW. This main acts as a trunk as well as a service main, as it is fed directly off the 20-inch third high-service main in Illinois Avenue. It is proposed to extend this main from Fourteenth Street to Sixteenth Street in the near future.

Twelve-inch water mains were laid as follows:

Gallatin Street east from Sixteenth Street NW.

Sixteenth Street between Webster and Decatur Streets NW.

Webster Street west from Seventeenth Street NW.

Twenty-first Street south of B Street NW.

Fessenden Street between Wisconsin Avenue and River Road NW.

Shepherd Street west from Fourteenth Street NW.

Sixteenth Street north from Emerson Street NW.

Fourteenth Street between Jackson and Irving Streets NW.

Sixteenth Street between I and U Streets NW.

Of the above list of 12-inch mains the most important was the one laid in Sixteenth Street between I and U Streets NW. This main passes through a very important part of the northwest section where, formerly, large apartments and residences were supplied by 4-inch and 6-inch mains. These smaller mains were removed at the time of the laying of the 12-inch main. The line of this main is in the parking practically all of the way, and at the writing of this report hardly a trace can be found showing the line of trench where opened.

The 12-inch main laid in Sixteenth Street between Webster Street and Colorado Avenue NW. was a supplemental main for the third high area and affords an increased supply as well as better fire protection.

Repaired the 36-inch United States Government main in First Street SE. twice during the year.

INSTALLATION AND MAINTENANCE OF WATER METERS, ETC.

On July 16, 1921, the work of installation and maintenance of water meters, taps, and inspection of service pipes was turned over to this division. The following amount of work has been completed from that date until June 30, 1922:

Meters installed:

New locations.....	2,043
For building purposes.....	51
District of Columbia meters:	
Leaking, replaced.....	904
Not registering, replaced.....	1,731
Choked, replaced.....	25
Removed for lack of pressure.....	101
Adjusted to grade.....	126
Abandoned.....	63
Repaired in place.....	211
Removed for repairs.....	145

District of Columbia meters—Continued.

Removed on account of noise.....	26
Reset on new service pipes.....	25
Set, temporary.....	162
Removed, temporary.....	107
Set temporary, removed.....	22
Reported leaking, found O. K.....	241
Private meters:	
Not registering, removed.....	312
Leaking, removed.....	109
Repaired in place.....	28
Removed for lack of pressure.....	17
Adjusted to grade.....	8
Reset after repairs.....	285
New service pipes inspected.....	1, 901
Service pipes inspected for repairs.....	559
Taps installed (sizes $\frac{3}{4}$ inch to 2 inches).....	2, 182
Taps removed, main plugged.....	43
Service pipes abandoned.....	33
New covers placed on curb boxes.....	47
Curb boxes adjusted.....	39
Meter boxes adjusted.....	68
Meter boxes replaced.....	74
Average cost of installing a $\frac{3}{8}$ -inch water meter by the department, in cellars:	
Meter ¹	\$7. 75
Material.....	1. 51
Labor.....	1. 04
Total.....	10. 30

STEAM ENGINEERING.

The following is a summary of the work done at the District pumping station during the year:

Water pumped, figured from plunger displacement:

First high service.....	gallons..	7, 172, 011, 620
Second high service.....	do.....	3, 351, 228, 560
Third high service.....	do.....	1, 216, 843, 990
Total.....	do.....	11, 740, 084, 170
Fourth high service.....	do.....	91, 951, 380
Coal burned.....	tons.....	7, 333
Cylinder oil used.....	gallons..	1, 072
Engine oil used.....	do.....	1, 377
Filtered oil used.....	do.....	1, 089
Turbine oil used.....	do.....	1, 050
Grease used.....	pounds..	414
Waste used.....	do.....	656

The regular force employed at this station in the daily operation of the pumping engines, boilers and auxiliaries, cleaning of machinery, etc., consisted of three crews of three engineers in charge, three assistant engineers, three firemen, three oilers, and three cleaners, working in 8-hour alternate shifts, "six days on and one day off" per week, being relieved on "days off" by an extra engineer crew.

For the fourth high service the water is pumped from the Reno Reservoir, which is supplied by the third high service pumps, to an elevated tank by gasoline engines and triplex pumps. This machinery is operated daily by three enginemen who work on 8-hour shifts.

¹Stock meter. No meters were purchased during the year

The water pumped for this service during the year was 91,951,380 gallons, or a mean of 251,922 gallons daily.

The Anacostia pumping station has been operated without interruption during the year, pumping to the three towers supplying the area east of the Anacostia River. This station is taken care of by four enginemen who work on 8-hour shifts. The water pumped for this service during the year was 145,916,180 gallons, or a mean of 399,770 gallons daily.

The total pumpage for the year at the District pumping station was 380,191,440 gallons more than in 1920-21. The greatest amount pumped in 1 day (January 10) was 38,340,780 gallons; least in 1 day (January 9) was 25,376,620, and the average dynamic head against pumps was 122.7 feet. The total operating expenses (excluding overhead) chargeable to pumping was \$102,637.92, as against \$118,195.29 in 1920-21, making the total operative cost (excluding overhead) of pumping 1,000,000 gallons of water into the mains \$8.74. This is \$1.66 per million gallons less than in 1920-21, and is mainly due to a reduction in the cost of the coal used. The average cost of coal per ton for the year was \$6.94, which was \$2.26 less than in 1920-21.

The station duty for the year was 75,558,706 foot-pounds per 100 pounds of coal. This is 11 per cent more than the duty obtained during the preceding year, and represents an annual saving of approximately 212.2 gross tons of coal. This saving in coal may be attributed partly to a slightly greater proportionate amount of work performed by the high-duty pumping units, and largely to the improved economic operation.

Especially important work done during the year includes (1) replacement at the District pumping station under contract No. 7170 of our old Nos. 1 and 2 Babcox & Wilcox boilers with new ones, by the Babcox & Wilcox Co. of Philadelphia; (2) necessary repairs made to our present Nos. 3 and 4 boilers, which will probably add about 6 years or more to the life of same; (3) replacement of the original reduction gear, casing and bearings on No. 1 pumping unit with new parts, including roller bearings, after the rotor had been repaired at the factory; (4) erection under contract No. 7199 of a cast-iron platform around No. 3 pumping unit by J. C. Moyer, of Philadelphia; and (5) installation of "S-C" feed-water regulators on boilers Nos. 5 to 8; (6) the installation of mufflers on engines at Anacostia pumping station; and (7) preparation of specifications covering proposed 10,000,000 gallons centrifugal pumping unit for the third high service.

WATER SURVEYS.

Since July 16, 1921, the work of this division has included the handling of all complaints of leaks, damp cellars, low pressures, no water, and similar cases previously disposed of by the water registrar's office. This work was transferred to the Water Survey Division, together with the personnel formerly handling it, for the purpose of consolidating all leaks and allied investigations under one organization. In the tables submitted herewith showing the activities of this division during the past year this new work is classified under "complaint investigations" as opposed to "underground leak investigations" which covers the work previously handled by the water survey divi-

sion. All work performed during the year is covered by the tabulated statements and lists on file.

Particular attention is invited to the fact that the total underground leakage found and prevented was at the rate of 1,678,500 gallons daily, the largest quantity found in any single year since 1917. This is particularly significant of increasing leakage in view of the fact that a smaller force was engaged in this work. The average waste per lead (5,952 gallons per day) is slightly higher than the previous year's figure but substantially the same as for the past 10 years. A total of 282 individual underground leaks was found against 187 last year; an increase of approximately 50 per cent. This is the greatest number found since 1917. Ample evidence is available supporting the theory that the underground leakage is increasing rapidly.

It has been particularly gratifying to note throughout the year a complete absence of friction between the field forces and the public with which they deal as well as a most conspicuous desire to assist each other in the matter of disposing of all where cases overlapping of duties or cooperation is necessary. This feature is creditable to the employees and is worthy of the department's appreciation.

YEAR'S RESULTS, 1921-22.

Underground leakage investigations.

Service pipes inspected:	
Metered.....	18,547
Unmetered.....	1,755
Houses inspected, unmetered.....	4,048
Houses with defective fixtures.....	75
Number of notices served.....	135
Number of services cut off.....	24

Underground leakage.

Class.	Number.	Gallons. per day.
Abandoned services, taps, etc.....	6	57,400
Iron services.....	62	450,240
Lead services.....	23	254,700
Wiped joints.....	15	88,260
Services, metered.....	22	116,436
Couplings.....	5	15,700
Stopcocks.....	2	5,000
Joints on mains.....	58	449,640
Fire hydrants.....	0	0
Horse troughs.....	0	0
Valves.....	3	20,300
Broken main.....	1	200,000
Meters.....	85	20,850
Total.....	282	1,678,526

Complaint investigations.

Complaints answered.....	3,541
Reexaminations.....	4,405
Cut-offs.....	442
Water supplies turned on.....	7
Abandoned services cut off.....	7
Leaks on mains found.....	25

STORES AND ACCOUNTS.

The cost of operating the storekeeping division for the year was 3.45 per cent of the value of the material issued and equipment disposed of.

	Per cent.		Per cent.
1915.....	4.676	1919.....	3.72
1916.....	4.64	1920.....	4.13
1917.....	3.91	1921.....	3.05
1918.....	3.13	1922.....	3.45

A complete inventory of all material and equipment owned by the department was prepared and forwarded to the auditor, District of Columbia. This inventory also showed receipts and expenditures of all material and equipment from October 1, 1920, to September 30, 1921.

Old material was delivered to the contractor to the value of \$1,705.08.

All equipment worn out during the year was collected, inspected, condemned, and disposed of as ordered by the auditor, District of Columbia.

The values of material and equipment handled during the year were as follows:

Material received, \$350,242.76; issued, \$350,837.75. Equipment received, \$36,673.28; issued, \$23,673.80.

Value of material on hand at close of year was \$185,348.80, and the value of equipment in stock and in service at close of the year was \$713,842.44.

TRANSPORTATION.

The present transportation equipment comprises 35 automobile trucks of various capacities suitable for the work of the department.

Average number of trucks in service daily was 32.

Hauled for use by the construction forces and for storage in property yards, 15,740,200 pounds of material, about 7,870 tons.

Hauled from construction jobs to various dumps, 1,228 loads of dirt, about 4,300 cubic yards.

Hauled from the pumping station to various dumps, 304 loads of ashes, about 1,500 cubic yards.

Schedule of rates for trucks per day of eight hours:

5-ton truck, with driver.....	\$16
3½-ton truck, with driver.....	14
2½-ton truck, with driver.....	12
1-ton truck, with driver.....	9
Ford trucks, with driver.....	8

These rates are about one-half the rates charged by contractors; however, the total charges for use of trucks during the year exceed the cost of maintenance and operation of trucks by \$4,182.44. The cost of maintenance and operation of trucks includes gasoline, oil, grease, tires, miscellaneous supplies, material and labor expended in repairs, garage rent, driver's wages, and a charge for depreciation.

Statement of the water fund of the District of Columbia for the fiscal year ended June 30, 1922.

CREDITS.

Water fund, cash balance in the Treasury of the United States.....	\$161,344.46	
Requisition balances:		
Water department, District of Columbia, 1921.....	39,664.18	
Increase of compensation, water department, District of Columbia, 1921.....	3,471.74	
Water department, District of Columbia, 1920.....	3,972.10	
Increase of compensation, water department, District of Columbia, 1920.....	878.70	
		\$209,331.18
Water rents.....	943,182.45	
Taps and stop cocks.....	12,145.45	
Water main assessments.....	83,746.41	
Interest.....	2,679.15	
Sales of material.....	2,455.49	
		1,044,208.95
Repayments and credit transfers.....		54,220.14
		<u>1,307,760.27</u>

DEBITS.

Appropriation, water department, District of Columbia, 1922:		
Salaries—		
Revenue and inspection branch.....	\$38,319.56	
Distribution branch.....	57,114.67	
Contingent expenses.....	4,349.43	
Maintenance and operation.....	392,185.88	
12-inch main, Sixteenth Street, between I and U Streets.....	28,304.05	
Extension distribution system.....	127,231.63	
Installing water meters.....	19,809.36	
Installing fire and public hydrants.....	18,150.82	
Refunds.....	1,187.24	
		686,652.64
Increase of compensation, water department, District of Columbia, 1922.....		24,212.05
Appropriation, water department, District of Columbia, 1921:		
Contingent expenses.....	\$1,278.00	
Maintenance and operation.....	32,556.11	
Extension distribution system.....	852.89	
Installing water meters.....	3,684.78	
Installing fire and public hydrants.....	13,033.10	
		51,404.88
Increase of compensation, water department, District of Columbia, 1921.....		825.76
Appropriation, water department, District of Columbia, 1920:		
High service.....		1,842.85
Appropriation, water department, District of Columbia, 1919 and prior high service.....		3.00
Refunding water rents, etc., District of Columbia.....		6,822.56
		<u>771,763.74</u>
Total water department expenditures.....		
Advances account, Washington Aqueduct appropriations:		
Washington Aqueduct, District of Columbia, 1922....	\$198,547.69	
Increase compensation, Washington Aqueduct, District of Columbia, 1922.....	21,000.00	
Washington Aqueduct, District of Columbia, 1921....	5,338.94	
Increase compensation, Washington Aqueduct, District of Columbia, 1921.....	34.84	
		<u>224,921.47</u>
		996,685.21

Balance June 30, 1922:

Cash in Treasury of the United States.....	\$244,373.75	
Cash in hands of the collector of taxes, District of Columbia.....	3,818.55	
Cash on requisition to the credit of the disbursing officer.....	62,882.76	
		\$311,075.06
		1,307,760.27

Balance in the water fund, as above stated..... 311,075.06
 Less obligations against appropriations:

Water department, District of Columbia, 1922—		
Contingent expenses.....	507.06	
Maintenance and operation.....	36,496.45	
Installing water meters.....	84.00	
Extension of distribution system.....	22,798.68	
Installing fire and public hydrants.....	969.00	
Water department, District of Columbia, 1921—		
Contingent expenses.....	3.95	
Maintenance and operation.....	227.36	
		61,086.50
Unobligated balance.....		249,988.56

TABLE II.—Cost of work done by the water department for the year ended June 30, 1922.

Heads of expenditure.	Per diem and salaries.	Material expended, cuts and transportation.	Total expenditures.	Charge to general account.		Hauling and deposit accounts. Dr.
				Maintenance.	Extensions.	
Water surveys (detection of leaks).....	\$25,068.75	\$3,368.40	\$28,337.15	\$28,337.15		
Maintenance of meters.....	18,192.35	5,762.46	23,854.81	23,854.81		
Installation of meters.....	12,894.89	18,740.63	31,535.52		\$31,535.52	
Office of water registrar.....	68,714.88	4,679.02	72,693.90	72,693.90		
Inspection and repair of services.....	17,399.34	4,265.81	21,565.15	21,565.15		
Tapping water mains.....	5,457.51	9,332.06	14,689.57		14,689.57	
News service installed.....	271.27	126.18	397.45		397.45	
Engineering (field surveys).....	23,220.27	3,807.98	26,928.25		26,928.25	
Hauling account.....	12,154.41	3,963.37	16,017.78			\$16,017.78
Operation and repair of valves, fire hydrants, etc.....	24,090.79	3,532.93	27,523.72	27,523.72		
Installation of fire and public hydrants.....	3,503.58	12,726.44	16,130.02		16,130.02	
Water mains laid.....	52,000.45	96,465.47	148,365.92		148,365.92	
Repairs to leaks.....	21,998.21	7,514.75	29,412.96	29,412.96		
Maintenance of reservoirs, lodges, and towers.....	3,591.10	637.17	4,128.27	4,128.27		
Care of grounds.....	7,660.05	66.48	7,626.53	7,626.53		
Repayment and deposit work.....	27,179.84	33,898.12	60,977.96			60,977.96
Replacement work, lowering mains, etc.....	8,309.79	12,242.21	20,452.00	20,452.00		
Plans, estimates and tests.....	14,535.41	390.72	14,826.13	9,878.75	4,937.38	
Care of Bryant Street pumping station.....	24,328.38	3,888.38	30,116.76	30,116.76		
Operation and repair, pumps, Bryant Street station.....	46,294.94	95,277.13	141,472.07	141,472.07		
Operation and repair, pumps, Reno station.....	5,600.80	1,211.30	6,712.10	6,712.10		
Operation and repair, pumps, Anacostia station.....	8,978.15	3,651.80	12,629.95	12,629.95		
Shopwork.....	17,381.77	13,776.04	31,157.81	31,157.81		
Furnished other District of Columbia offices.....	4,126.42	32.33	4,159.75	4,159.75		
Gross expenditures.....	452,953.35	338,788.18	791,741.53	471,721.68	242,984.11	77,025.74

SUMMARY.

Expenditures:		Charge to:		Per cent.
Per diem pay rolls.....	\$357,589.68	Maintenance.....	\$471,731.68	66
Salary pay rolls.....	95,363.67	Extensions.....	242,984.11	34
Total services.....	452,953.35			
Material expended, cuts, etc.....	338,788.18			
Gross expenditures.....	791,741.53			
Less transportation and repayment credits.....	77,025.74			
Net expenditures.....	714,715.79		714,715.79	100

TABLE III.—Statement of the distribution system, including mains laid by the United States, the District of Columbia, and on account of repayment work.

Diameter.	In service June 30, 1921.	Laid dur- ing year ending June 30, 1922.	Abandon- ed during year end- ing June 30, 1922.	In service June 30, 1922.
1-inch.....linear feet.....	84,748	1,023		85,771
2-inch.....do.....	154,967	352	155	155,164
3-inch.....do.....	1,466,610	1,351		1,467,961
4-inch.....do.....	944,997	40,880		985,877
6-inch.....do.....	9,107			9,107
8-inch.....do.....	410,338	14,674		425,012
10-inch.....do.....	26,018	3,566		29,584
12-inch.....do.....	119,730	8		119,738
14-inch.....do.....	36,125	8		36,133
16-inch.....do.....	58,000			58,000
18-inch.....do.....	59,433			59,433
20-inch.....do.....	23			23
24-inch.....do.....	44,172			44,172
30-inch.....do.....	600			600
Total.....	3,414,868	61,862	155	3,476,575
Stop valves.....	11,153	272	73	11,352
Fire hydrants.....	3,730	162	78	3,814
Public hydrants.....	238	17	2	253
Sanitary fountains.....	17	5	1	21
Horse fountains.....	154	0	1	153
Public wells.....	44	0	0	44

TABLE IV.—Statement of the length and cost of water mains laid from July 1, 1878, to June 30, 1922, paid from Water Department funds.

Diameter.	In service June 30, 1921.	Laid dur- ing year ending June 30, 1922.	Abandon- ed during year end- ing June 30, 1922.	In service June 30, 1922.
1-inch.....linear feet.....	77,159			77,159
2-inch.....do.....	116,389	136	155	116,370
3-inch.....do.....	1,077,737	1,244		1,078,981
4-inch.....do.....	885,542	40,768		926,310
6-inch.....do.....	6,739			6,739
8-inch.....do.....	360,886	8,110		368,996
10-inch.....do.....	18,870	3,566		22,436
12-inch.....do.....	108,636			108,636
14-inch.....do.....	15,653			15,653
16-inch.....do.....	20,437			20,437
18-inch.....do.....	38,244			38,244
20-inch.....do.....	23			23
24-inch.....do.....	14,309			14,309
Total.....	2,740,624	53,824	155	2,794,293

Total cost to June 30, 1921.....\$4,329,366.10
 Total cost for year ending June 30, 1922.....148,365.92

Aggregate cost to June 30, 1922.....4,477,732.02

REPORT OF THE WATER REGISTRAR.

WASHINGTON, August 28, 1922.

SIR: I submit herewith the annual report of the revenue and inspection branch of the water department, showing in detail the work accomplished during the year ended June 30, 1922.

WATER RATES.

The rate for domestic purposes is charged according to stories and front feet. On all tenements two stories high with a frontage of 16 feet or less, \$6.25 per annum; for each additional front foot, or fraction thereof greater than one-half, 39 cents. For each additional story or part thereof, one-third of the charges as computed above.

Business premises are rated according to their size, class, volume of business, and water facilities, and rate from \$1 to \$25. If the flat rate on business establishments reaches \$25 or more, the owner or occupant is required to install a water meter at his own expense.

A minimum rate of \$5.65 will be charged against all consumers supplied with water through meters, which allows the use of 7,500 cubic feet of water during the year; water used in excess thereof will be charged for at the rate of 5 cents per 100 cubic feet.

TABLES.

The table of comparative revenues shows a total collection of \$1,044,208.95.

Table 1 shows statement of cash receipts of the water fund.

Table 2 shows comparative statement of revenues.

Table 3 shows general information.

GEO. W. WALLACE,

Water Registrar, District of Columbia.

The SUPERINTENDENT, WATER DEPARTMENT.

TABLE 1.—Statement of collections.

Water rents:	
Flat rate.....	\$97, 458.52
Meters.....	840, 747.29
Building purposes.....	4, 976.64
Total.....	943, 182.45
Water-main tax, principal and interest.....	86, 425.50
Taps and stopcocks.....	12, 115.45
Miscellaneous receipts.....	2, 455.49
Total.....	101, 026.50
Total receipts.....	1, 044, 208.95

TABLE 2. *Statement of cash receipts of the water fund, District of Columbia, for the fiscal years from June 30, 1912, to June 30, 1922.*

Year.	Water rents.	Watermain tax, principal and interest on same.	Taps and stopcocks.	Miscellaneous receipts.
1912.....	\$345,405.47	\$122,458.81	\$11,438.65	\$2,817.50
1913.....	640,008.64	138,693.57	8,685.50	3,153.81
1914.....	646,296.15	86,379.21	6,118.20	4,253.20
1915.....	638,861.89	66,107.56	6,559.89	3,532.77
1916.....	624,882.18	64,647.80	7,020.80	1,761.39
1917.....	636,664.31	61,990.43	5,484.62	2,019.58
1918.....	714,388.28	34,649.46	3,705.65	458.96
1919.....	782,159.36	28,179.43	4,810.28	1,482.58
1920.....	771,161.55	43,121.19	6,906.47	1,164.01
1921.....	984,055.23	78,989.83	5,734.70	1,557.73
1922.....	943,182.45	86,425.56	12,145.45	2,455.49
Total.....	7,927,065.51	811,642.85	78,610.21	24,657.02
1923 ¹	938,000.00	86,000.00	6,000.00	1,500.00
1924 ¹	930,000.00	85,000.00	6,000.00	1,000.00

¹ Estimated.TABLE 3.—*General information.*

Consumption of water through meters:	Cubic feet.
District meters.....	622,924,900
District meters in municipal buildings.....	96,058,400
Private meters.....	833,004,400
Private meters in charitable institutions.....	25,368,400
Total.....	1,577,356,100

Meters in service.	In use June 30, 1921.	Installed, 1922.	Abandoned, 1922.	Total in use June 30, 1922.
District meters.....	58,990	2,365	106	61,228
District meters in municipal buildings.....	264			264
Private meters.....	2,837	27	10	2,864
Private meters in charitable institutions.....	188	1		189
Total.....	62,279	2,393	116	64,545

Average cost of reading meters..... \$0.20

Average cost of computing and making bills..... \$0.26

Premises receiving an allowance of free water:

Number of institutions..... 159

Number of meters..... 189

Cubic feet of water consumed..... 25,368,409

Allowance of free water, cubic feet..... 39,043,365

Number of institutions exceeding allowance..... 30

Water services:

In use June 30, 1921..... 72,898

Installed, 1922..... 2,353

Total..... 75,251

Abandoned, 1922..... 240

In use June 30, 1922..... 75,011

Metered..... 64,630

Not metered..... 10,381

Percentage of services metered..... 86

REPORT OF THE SANITARY ENGINEER.

WASHINGTON, D. C., August 31, 1922.

SIR: The annual report of the sanitary engineer, covering the fiscal year ended June 30, 1922, is submitted herewith.

In presenting this report, particular attention is called to the fact that the extension of the District sewer system has been allowed to lag considerably behind the growth of the city, and due to the lack of

storm-water sewers the problem of handling surface water is becoming more and more difficult. It is believed that a more liberal allowance should be made for the extension of the sewer system, and to permit keeping abreast of other developments it is suggested that possibly about 5 per cent of the entire District budget be allotted to the drainage system. In the past 10 years the ratio of sewer division appropriation to the total District appropriations has gradually been reduced from $4\frac{1}{2}$ to $2\frac{1}{2}$ per cent. More liberal funds would furthermore permit the construction of much needed relief sewers required to prevent the oft-repeated flooding of basements due to the overcharging of sewers. These overcharged sewers were constructed many years ago and though presumably designed according to the best engineering practice of that date, yet, under present-day conditions, with impervious street surfaces and closely crowded buildings, the run-off is so rapid that these sewers of "antiquated design" have proven of insufficient capacity. Many relief sewers, at a cost of many thousands of dollars, are urgently needed to relieve this repeated flooding of both public and private property alike. Washington is not alone in facing this condition of overcharged sewers, and, as a typical example, it may be mentioned that St. Louis is now spending hundreds of thousands of dollars to remedy similar evils.

Attention is also invited to the need of more vigorous prosecution in continuing work on the construction of the three principal interceptors, upper Potomac, Anacostia main, and Rock Creek, which will tend to eliminate the pollution of streams flowing through the District. Due to the increase of suburban population in near-by Maryland towns this pollution is rapidly increasing, and also in view of the great amount of sewer work now being undertaken by the Maryland authorities, and in line with the recent agreement prepared by the Commissioners of the District of Columbia and submitted to the Washington-suburban sanitary commission of Maryland with the view to permitting the discharge from these Maryland sewers into District sewers, it seems but fitting that the necessary District sewers should be provided at as early a date as possible. There is yet required to be expended on the upper Potomac, Anacostia main, and Rock Creek main interceptors about \$750,000 to bring these projects to completion.

In addition to the above the time is not far distant when work must be undertaken on commencing the Oxen Run interceptor, estimated to cost about \$1,000,000. This interceptor is required to properly take care of a large area east of the Anacostia River now occupied by many dwellings and at this time without sewer facilities.

A serious situation facing this division is its inability to provide service sewers necessary in connection with building activities in progress or contemplated. During the fiscal year just ended building permits were issued to the unprecedented amount of \$36,197,056, which exceeded by \$13,537,604 any previous year. As a result of this enormous amount of new building, the fiscal year ended with \$120,630 worth of service sewers ordered and not built.

The following is a summary of the sewerage and sewage-disposal systems, as of June 30, 1922.

Length of sewerage system:	Miles.	
Main sewers.....	152.31	
Pipe sewers.....	611.66	
		763.97
Length of sewage disposal system.....		36.69
Total length.....		800.66
Cost of sewerage system.....	\$15,412,515.28	
Cost of sewage-disposal system.....	5,975,232.96	
Total cost.....	21,387,748.24	

During the past year the organization of the sewer division has been developed by placing employees in responsible charge of the various sections of this division. These employees have responded admirably and I have to acknowledge the efficient and loyal support accorded the writer which has rendered possible any accomplishments achieved by this division. To foster the spirit of teamwork, the section heads meet informally with the sanitary engineer once each month to discuss matters of interest to the division.

A brief outline of the year's activities are recorded by sections, as follows, the detailed reports of the section heads being filed in this office:

SECTION OF OFFICE ENGINEERING, A. D. BLACK, PRINCIPAL ASSISTANT
ENGINEER, IN CHARGE.

The work of this section comprises the computing, designing, and drafting work incidental to studies for new construction, repairs, or improvements, and for future extensions of the system. This section also has jurisdiction over the mapping work of the division; the filing system of drawings and records, and undertakes the furnishing of information to the public as to availability, location, etc., of existing sewers as required in connection with building activities.

During the year detail studies were made in connection with 707 jacketed files, requiring the preparation of 96 drawings. The system of record maps was extended by the addition of 6 new maps, and in addition 4 old maps were replaced, as were 23 working maps which had worn out. All maps were kept posted throughout the year by plotting thereon new sewer work, 1,054 new subdivisions, alley closings, etc.; 219 studies of street grades as prepared by the engineer of highways (these grades having first been submitted to this office for study as to effect on the drainage system), and also location of new building construction. Four hundred and thirty-nine plats were forwarded to the assessor showing pending sewer assessment, connection of parcel property with service sewers, subdivision of parcel property abutting service sewers, and where trunk sewers were constructed as service sewers. Thirty right-of-way deeds with accompanying plats were prepared, 16 of which were acquired. Thirty contracts were prepared, involving the accompanying drawings and estimates of quantities. In addition, card records of the various activities of this section were maintained. Through this section has been initiated the system of standardizing the size of all drawings, which system has been incorporated in "Office procedure" for the fiscal year 1923; and also through this section has been initiated the

practice of printing border and title block on standard blanks for drawings, thus greatly increasing the efficiency of the drafting force by the elimination of the laborious work of penning an elaborate title.

In advance of all surface work a study is made of sewer requirements and to prevent future cutting of new paving such sewer work as is necessary is undertaken. During the year this involved 288 such studies.

The work handled by this section is by far the most exacting of that required by any section; and the large part of the activities of this division are dependent upon the conduct of this office. With the low salaries available it is practically impossible to obtain the services of technically trained men required for the proper handling of this work, and great credit is due the present personnel of this force for the work that is actually performed.

The outstanding need of this section is the creation of a subsection of computing to permit of an intelligent study of the very important question of drainage and sewer sizes; but great difficulty has been experienced in obtaining the services of properly qualified men with the necessary education and knowledge of mathematics and hydraulics required to undertake this work.

SECTION OF SURVEY AND CONSTRUCTION ENGINEERING, C. C. BADEN,
ASSISTANT ENGINEER, IN CHARGE.

The work of this section covers the supervision of all contract work and the preparation of payments for same; the staking out of all work done by day labor; all preliminary and detail survey work required in connection with office studies; and special reports based on field inspections and necessary field data.

Work done under 26 contracts involved 3.3 miles of sewers at a cost of about \$165,000, as follows.

Of contracts awarded during the fiscal year 1921 all were completed, as follows: Spring Road relief sewer in Thirteenth Street between Spring Road and Upshur Street; Eighth Street service sewer between Buchanan and Decatur Streets; Varnum Street service sewer, between Sixteenth and Seventeenth Streets; Morris Road service sewer between Bryan Place and Pomeroy Road; upper Potomac interceptor, section 4, west of the Aqueduct Bridge.

The contracts awarded during the fiscal year 1922 and entirely completed during the year are enumerated as follows: Thirty-ninth Street trunk sewer outlet, through square 1857; Piney Branch trunk sewer, section 11, between Illinois Avenue and Seventh Street; Maccomb Street trunk sewer, section 4, in Newark Street between Thirty-fourth and Thirty-sixth Streets; Seventeenth Street relief sewer, between P and Corcoran Streets; Dalecarlia intercepting sewer, section 3, in grounds of the Dalecarlia Reservation; outlet, Petworth Valley trunk sewer, section 4, crossing Fourteenth Street in line of Varnum Street; T Street trunk sewer, section 2, between Fourteenth and Sixteenth Streets; outlet, Illinois Avenue trunk sewer, crossing Gallatin Street in line of Ninth Street; Good Hope Run trunk sewer, section 3, in Seventeenth Street and alley of square 5613; Alabama Avenue southeast service sewer, between Tenth Place and Logan Place; Kansas Avenue relief sewer, in Shepherd Street and alleys of

square 2907; Newark Street combined system sewer, between Reno Road and Thirty-third Place; Connecticut Avenue service sewer, between Cathedral Avenue and Jewett Street; Kentucky Avenue service sewer, between C and D Streets; Pinehurst service sewers in Tennyson and Thirtieth Streets; Bladensburg Road and Twenty-eighth Street service sewer, in Channing Street, Bladensburg Road and Twenty-eighth Street; Allison Street service sewer, between Sixteenth and Seventeenth Streets; and Ingomar Street service sewer, between Forty-second and Forty-third Streets.

Contracts for Monroe Street service sewer, between Eighteenth and Twentieth Streets NE.; Thirtieth Street service sewer, between Albe-
marle and Brandywine Streets; and Grant Street service sewer, between Minnesota Avenue and Forty-second Street, were partly completed during the fiscal year.

Contracts let during the fiscal year, on which no work was done, are: O Street replacement sewer, between First Street and New Jersey Avenue; Broad Branch trunk sewer, section 1, in Nevada Avenue between Chappel Road and Legation Street; Stephenson Place service sewer, between Thirty-second Place and Utah Avenue; Quesada Street service sewer, between Western Avenue and Broad Branch Road; M Street relief sewer, section 1, between Twentieth and Twenty-second Streets; Seventeenth Street and Otis Street service sewer, NE.; Allison Street and Eighteenth Street service sewer, and new invert, Indiana Avenue trunk sewer, between First and Third Streets. This latter contract is the most important betterment of the sewerage system provided for during the year.

This contract work necessitated the preparation of 30 measurement sheets. Sewer construction under day labor, requiring the necessary staking out, amounted to over 10 miles. As a record of new construction, 162 detailed record sheets were prepared. In addition, some 20 miles of profiles were run and plotted, required in connection with office studies.

It should be noted that the only work done toward completing the interceptors of the sewage disposal system already under way was the construction of 314 linear feet of the upper Potomac interceptor, at a cost of \$4,885.71.

One hundred and eleven plats were furnished the assessor showing in detail the locations of new service sewers, and 6 letters were forwarded to the health officer indicating the location of new sewers where same abutted existing houses. One hundred and seventy-five special reports were made on applications for the connection of area drains to separate system sewers.

The work of this section has increased to such an extent during recent years that the present force is hardly more than able to keep pace with current work. The creation of an additional field party with necessary transportation is greatly needed in order to facilitate the making of preliminary surveys in the rapidly developing outlying districts.

SECTION OF DAY LABOR CONSTRUCTION, T. LANIGAN, OVERSEER, IN CHARGE.

The work of this section covers the construction of all new sewer work not contracted for, and all basin work and necessary repairs.

During the fiscal year 1.54 miles of main sewers and 8.62 miles of pipe sewers, a total of 10.16 miles, were constructed. This construction was distributed rather evenly throughout the District, as indicated below:

	Miles.
Within old city limits.....	1.10
County west of Rock Creek.....	2.91
County east of Rock Creek.....	3.31
County west of Anacostia River.....	1.39
County east of Anacostia River.....	1.44

In addition to new sewer work, 83 storm water catch basins were constructed during the year and 588 minor repair jobs were undertaken.

On account of the greatly scattered area in which work must be performed, it is necessary to maintain 5 construction gangs under competent foremen, and in that gangs must often be split for work in two locations simultaneously, each gang is provided with a timekeeper qualified to act as subforeman. It is felt that if the restriction confining day labor work to the smaller jobs estimated to cost \$1,000 or less was removed, the overhead charges on day labor construction could be reduced materially by assigning larger gangs to the above foremen, thus permitting a permanent splitting of gangs, one to be supervised by the subforeman.

In two instances during the year especial authority was granted by the commissioners to execute by day labor jobs estimated to cost in excess of \$1,000. This work consisted of the junction chamber in the Slash Run trunk sewer at Twenty-second and M Streets, necessary to afford an outlet for the proposed M Street relief sewer, at a cost of \$3,924.99; and the concrete lining in Potomac Street trunk sewer under the Chesapeake & Ohio Canal, necessary to exclude large quantities of canal water leaking into the sewer and requiring to be pumped at Rock Creek substation and again at the main pumping station, at a cost of \$1,751.19.

The outstanding need of this section is motor transportation to replace horse-drawn vehicles now used by the overseer in charge of repair and betterment work, and by the general timekeeper of this section, who also acts as assistant to the general foreman and in the absence of the latter substitutes for him. A further need is an additional motor truck.

SECTION OF CHIEF CLERK, J. H. DICK, COMPUTER, IN CHARGE.

The work of this section covers the preparation of pay rolls, requisitions and vouchers, material and equipment accounting, cost keeping and general records. In addition, this section prepares monthly financial statements to permit a study of available balances. In that all unexpended balances on June 30 revert to the United States Treasury unless previously obligated, it is essential that a close watch be kept over the finances to prevent the forced lay-off of employees from lack of funds, or the reverting of moneys appropriated for much needed sewer activities. As a result of this phase of the work, the unexpended balances of the construction and maintenance appropriations for the fiscal year 1922 were zero.

The work of this section covered the following expenditures from 1922 appropriations:

Cleaning and repairing sewers and basins.....	\$80,000.00
Operation and maintenance of the sewage pumping service.....	98,000.00
Main and pipe sewers and receiving basins.....	120,000.00
Suburban sewers.....	225,000.00
Assessment and permit sewers.....	157,000.00
Purchase or condemnation of rights of way.....	3,642.20
Miscellaneous trust fund deposits.....	12,459.96
Miscellaneous appropriations.....	12,279.59
Total.....	708,381.75

The annual inventory report of all expendable and nonexpendable material and equipment was forwarded, as were the quarterly reports of cost of operation, repair and mileage of the 12 motor vehicles maintained by this division. Daily reports were prepared showing the various activities of the division. A total of 69,101 reports and records were handled by this section.

During the year this section moved to new quarters, room 311, and in addition to vacating much needed space, this force is now more conveniently situated for the performance of their duties.

Adopting a policy of penalizing annual leave for sick leave taken, except in cases of serious and protracted illness, has possibly been responsible for the salutary effect of reducing sickness in the office force by about 18 per cent over the previous year.

SECTION OF OPERATION AND MAINTENANCE, H. GARNER, INSPECTOR, IN CHARGE.

The work of this section covers cleaning storm-water outlets, collecting rainfall data, recording flow in sewers, annual inspection of trunk sewers, inspection and maintenance of sewage regulators, sumps and tide gates, investigating complaints, basin cleaning and flushing, and flushing and cleaning pipe sewers.

With the combined system of sewers as operating in Washington it is necessary to clean storm-water outlets after each storm, since diluted sewage, discharging at these points, would become offensive if the conditions existing at the outlets after storms were not attended to. Notable examples of such outlets requiring attention are in Piney Branch valley just west of Sixteenth Street, which required cleaning 105 times during the year, also at Sargent Road and Bunker Hill Road, and at Stickfoot Branch crossing Howard Avenue. In addition, to enable the sewers to properly function, it is necessary from time to time to remove the large quantities of sand and gravel that is deposited in gravel basins and inverted siphons and back of the dam across Rock Creek just below Massachusetts Avenue.

Data for run-off studies were gathered from 4 automatic and 21 pot gauges located throughout the District. In making studies, with a view of taking care of excessive rainfall, it is essential that the rate of precipitation be known, and, since the pot gauges register the total fall only it is felt that additional automatic gauges are badly needed.

During the year there was but one storm of excessive precipitation, occurring on July 15, 1921, which, as reported by the United States Weather Bureau showed a maximum precipitation during 5 minutes

at a rate of 7.92 inches, during 10 minutes of 6.78 inches, during 15 minutes of 5.88 inches, and during 20 minutes of 4.74 inches. As a result of this storm most of the sewers in the city were overcharged, flooding the streets in the low areas and causing the water to back up in the basements of many houses. A storm was experienced on July 11, 1921, which, while not considered excessive, caused the death of two little children who were playing in an open drain in the grounds of the Soldiers Home and who were caught in the flood of water caused by the sudden rainfall and swept to their death in the sewer. The inlet to this sewer has since been protected.

To determine the flow in trunk sewers during excessive storms, with a view of a study to relieve the overcharging of same, cup gauges are installed in the sewers at strategic points. During the year the number of such gauges was increased from 21 to 99 and much valuable information is being obtained therefrom. It is proposed to install many more such gauges in the future.

At a cost of \$1,200.70, an inspection was made of the interior of 125 miles of the 192 miles of trunk sewers in the District and same were found to be structurally good. As a result of this inspection 86 minor repairs were found to be necessary. The outstanding results of this inspection were found to be an accumulation of silt, 33 inches deep in one sewer and in several instances 24 inches deep. This silting up of sewers was found to be more or less general, creating a very serious condition, especially in view of the inadequacy in size of sewers which are subject to overcharge in times of severe storms. A very urgent need of this division is an additional appropriation of \$16,500 for the employment of the necessary force to properly clean these trunk sewers and maintain same free from deposits.

Four thousand eight hundred and twenty-nine inspections, at a cost of \$3,388.23, were necessary in connection with maintaining the 17 sewage regulators, 95 sumps, and 63 tide gates in the sewerage system. These appurtenances are theoretically automatic in their operation; but trash washed down with each rain so interferes with their operation that in order to insure satisfactory results constant supervision is necessary. The proper functioning of these appurtenances is necessary to divert sewage to the pumping station and to prevent storm and river water from being carried to the pumps. The territory covered by this activity extends over the entire District, and automobile transportation should be substituted for horse-drawn transportation of this outfit, which would result in a greatly increased efficiency.

One thousand and sixty-one complaints were investigated and acted upon. These complaints were made up, the most part, of obstructed house connections and catch basins and offensive odors arising from dead animals which had been thrown into basins. These complaints have increased about 100 per cent in the past two years, and it is becoming more and more difficult to handle this service with the slow-moving horse-drawn transportation furnished the inspector in charge of this work.

A total of 21,165 city basins were cleaned at a unit cost of slightly less than \$1, this cost including labor and team hire but not disposal: 5,202 cubic yards of sludge being removed from same. In the county 4,022 basins were cleaned of 3,300 cubic yards of sludge at a

unit cost of \$1.35. In the summer the force on this work is increased to cope with the great amount of sand and gravel washed into the basins by the heavy storms. It is the hope of this division to soon motorize the city basin cleaning outfit, and, it is believed that the purchase of five 1-ton Ford trucks to replace the 10 horse-drawn vehicles now operating would result in a saving in operating cost during the first year that would more than pay for the complete initial cost of the five trucks. At a later date it is the idea of this division to motorize the county basin cleaning activity by the substitution for the 2-horse dump wagons of a 3-ton dump truck. On June 30, 1922, there were 6,302 catch basins requiring cleaning.

Ink sludge collected in the settling basins at the Bureau of Engraving and Printing was removed and disposed of by this division. Six hundred and ninety-six and five-tenths cubic yards of this material was removed; the cost of this work, \$2,811.13, being reimbursed by the bureau.

During the summer months it is necessary to flush all catch basins, thereby replacing the stagnant water required to seal basins against the sewer gases. This flushing is necessary in order to keep down offensive odors. At the time of flushing a small amount of oil is poured into the basins to prevent the breeding of mosquitoes. During the year 13,829 basins were flushed.

The work of pipe-sewer flushing consisted in the flushing of over 1,000 miles of pipe sewers to remove any solids that may have collected due to insufficient flow. This work represented an expenditure of \$4,576.85. This flushing is necessary to prevent an insanitary condition. There are 615 miles of pipe sewers in the District requiring flushing as above.

During the fiscal year, 32 miles of pipe sewers and 81 basin outlets were cleaned of 176 cubic yards of sand, gravel, and tree roots which were obstructing the flow. Cost of this activity, \$8,777.96. The force engaged upon this work is handicapped by not being supplied with a modern equipment, and it is estimated that by an expenditure of \$1,500 for a modern sewer-cleaning machine a saving of over twice that amount could be effected in the first year of operation.

In conjunction with the removal of snow from the street surfaces, manholes over sewers were made available for the dumping of snow. To prevent congestion in manholes and in the sewers, it was necessary to have an inspector at each dumping place. On the occasion of the heavy snowfall of January 28, 1922, 30 manholes were in service for the above purpose, requiring the services of 23 inspectors. In this cleaning 39,072 cubic yards of snow were dumped into the sewers.

The principal handicap against which this section is struggling is lack of motor transportation for the inspector in charge of these various activities. With his present horse-drawn vehicles it is physically impossible for this inspector to properly supervise all of these activities for which he is responsible.

SECTION OF PUMPING SERVICE ENGINEERING, R. S. CHAPIN, ASSISTANT
ENGINEER, IN CHARGE.

The function of this section is the keeping of records of performance of the mechanical equipment of the main sewerage pumping station and substations; the records of rainfall as affecting the operation of

storm water pumps; records of river flow and study of sewage dilution of the river; record of tides, etc. Also a study is now in progress to best show graphically the performance records at the station. This section, in addition, is making a study of the most modern methods practiced in the best equipped plants as well as a general theoretical study looking toward greater efficiency.

As a result of above studies there has been a gradual reduction in the consumption of coal, brought about by the hearty cooperation of the master mechanic in applying his wide practical experience to the carrying out of suggestions, the conclusions of theoretical studies.

As a direct result of these studies old and leaky steam valves have been renewed, the boilers in service have been reduced from two to one, boilers have been generally overhauled and a steam fitter has been assigned to the upkeep of same. In addition, work on the lagging of steam mains has been commenced. Further improvements are contemplated after a more thorough study and a further material reduction in operating costs is confidently looked for in the future, which will make this section of ever-increasing value to the division, both for economy and efficiency.

The maximum range of the tide of the river as indicated on automatic gauge was 4.4 feet. The river flow in second-feet varied from a minimum of 1,850, occurring October 17, 1921, and November 19, 1921, to a maximum of 78,000 recorded March 17, 1922; with a mean flow throughout the year of 11,130.

A study as to the dilution obtaining in the Potomac River due to discharge therein of sewage, indicates the following comparison with other recognized standards.

For the purpose of this comparison, the dilution is expressed as the flow in cubic feet per minute required to dilute the sewage of each 1,000 of population. The population of the District is taken at 437,571 and the flow of the Potomac 2,100 second-feet, the lowest average flow over a seven day period as recorded during the fiscal year (week of August 28–September 3):

Flow per 1,000 population:	Cubic feet per minute.
Potomac River.....	288
Chicago Drainage Canal.....	168–216
Minimum requirement for Chicago Drainage Canal as ruled by the Secretary of War.....	100
Requirements of committee of American Public Health Association....	240–360
Requirements as stated by Mr. Langdon Pearse in proceedings of the American Society of Civil Engineers, December, 1921 (temperature of water 77°).....	329
Requirements of English Royal Commission.....	1,667

The total pumpage in gallons for the year is shown as follows:

	Storm water.	Sewage.	Total.
Main sewerage pumping station.....	2,319,731,496	24,906,695,603	27,226,427,099
Poplar Point substation.....		821,735,317	821,735,317
Rock Creek substation.....		125,879,731	125,879,731
Woodridge substation.....		15,293,400	15,293,400
Total.....	2,319,731,496	25,869,604,051	28,189,335,547

Eliminating Rock Creek and Woodridge substations, which deliver their discharge to the main sewerage pumping station, the above would indicate a mean daily pumpage of sewage of 70,488,852 gallons.

To permit the burning of a grade of coal inferior to Georges Creek coal as used in the past, studies are being made toward possibly increasing the combustion chamber of the boilers by lowering and bringing forward the grates. As an assistance in this study, advantage is being taken of the experience of the Westinghouse Electric & Manufacturing Co. and the M. H. Detrick Co., with an idea of reaching a solution to prevent the constant burning out of grates and also to eliminate the smoke nuisance which has given rise to several complaints from the District of Columbia health officer.

The greatest need of this section is an additional computer and draftsman to relieve the assistant engineer in charge and allow him more time to make studies of modern methods and to come more directly in contact with the actual operating conditions.

SECTION OF MASTER MECHANIC, F. K. STEELE, PRINCIPAL STEAM
ENGINEER IN CHARGE.

The duties of this section consist in the maintenance and operation of the steam-driven main sewerage pumping station, and the electric driven Poplar Point, Rock Creek, and Woodridge substations. In connection with the maintenance and operation of these stations this section maintains a machine shop and a blacksmith shop; and, in addition to the operating force, employs electricians, steamfitters, screen operators, cleaners, and general utility men; a total force of 52.

During the year new valves were installed on steam lines between the main steam line and the 8 storm water pumping engines and the 4 sewage pumping engines. The side and bridge walls, Detrick arches, and stoker interiors were renewed in two boilers and 238 tubes replaced in the 6 boilers. New blow-off valves were installed on all 6 boilers, and 8-inch gate valves were renewed on steam lines between the 6 boilers, and the main header. Two boiler feed pumps, two Rooney stoker engines and ventilating fan engine were thoroughly overhauled. All steam mains were repaired and the hydraulic sludge press in screen room was overhauled. The chute from coal crusher to conveyor and from conveyor to scale hopper was renewed. In addition to above renewals, the pumps, engines, and generators were kept in repair; the principal items of repairs being as follows: Casting, machining, and installing new bronze sleeves as renewals on impeller shaft at pump stuffing boxes on sewage engines Nos. 1 and 2, Class I; casting, machining, and shrinking bronze sleeves on pump plungers; the casting, machining, and installing of new bronze sleeves as renewals on impeller shaft at stuffing box on Class II engine; installing Trips metallic packing in the high pressure piston rods of Class I engines; rebabbiting and fitting crosshead bearings on Class II engine; making and installing new oil guards and rings in thrust bearing on No. 1 engine, Class I; rebabbiting crosshead guide bearings and refitting pins on generator engine No. 2; and making and installing new high and low pressure steam valve stems for generator engines Nos. 2 and 3.

At Rock Creek substation new electric level indicators were installed; also metal screen doors.

As a precaution against accidents the Otis elevator at the main sewerage pumping station was equipped with a locking device and with semiautomatic lock gates at all floors. To permit withdrawing

the elevator from passenger use a stairway was installed at the north end of building between basement and ground level floors. This stairway was incased to prevent the permeation of odors throughout the building at times of cleaning the sediment chamber.

The total coal consumed at the main sewerage pumping station during the fiscal year amounted to 5,963 tons. Coal on hand July 1, 1921, 1,015 tons; coal received during fiscal year 5,638 tons; coal on hand June 30, 1922, 690 tons. Value of coal purchased \$45,212.50; value of coal used \$47,818.75.

Of the coal purchased, different coals were received as follows:

	Tons.
New River, run of Mine.....	2,582
Georges Creek, run of mine.....	3,056

With New River coal, especially, great difficulty was experienced in the burning out of grate bar webs, grate bars, fuel plates and grate-bar fingers; necessitating replacements costing \$1,318.56. This burning out of 5,000 fingers, especially, was unquestionably due to the low ash in New River coal. Throughout the year this question was given much study and various experiments undertaken as to rearrangement of grate surface. It is believed that this evil has now been somewhat reduced as the result of decreasing the load on the boilers, this being made possible through attack on leaky steam mains, unclean boilers, etc.

Beginning January, 1922, the dates for sediment chamber cleanings were predetermined, time based on low tides to permit disposal of sludge. This schedule calls for a cleaning at the main station once a month and at Poplar Point alternate months. During the fiscal year 1922, 8 cleanings were made, averaging about 5 days per cleaning. A total of 2,085 cubic yards of sludge was removed. At Poplar Point substation the sediment chamber was cleaned 5 times during the year, removing 192 cubic yards of sludge.

Débris removed from the screens amounted to 586 tons. These screenings were pressed in the hydraulic sludge press to free same from water and were then incinerated.

An unfortunate situation existing at the main sewerage pumping station is that, owing to insufficient appropriation, the operating force—all statutory employees—are required to work on a seven-day week basis instead of a six-day week as is required of all other statutory employees in the District service. This condition has gradually been breeding discontent which in turn might breed inefficiency and lack of an 'esprit de corps.' January 1, 1922, a new schedule was tentatively placed in effect of reducing the operating force from 6 to 5, which permitted the men to avail themselves of their 30 days' annual leave, and, in addition, gave them one day off duty on an average of about every 10 days. The above days off duty were reduced by the amount of any sick leave granted throughout the year. This reduction in the personnel of the operating force is considered an unfortunate necessity in that with such a reduction it becomes more and more difficult to maintain the desired efficiency of this plant. Apparently as a direct result of the placing in effect of this schedule, the sick leave taken by the operating force reduced 60 per cent in the latter half of the fiscal year as compared with the same period in the previous year.

While there are many wants at the stations, notably replacements of worn-out units, it is believed that the greatest need is provision for a swing watch, to permit the employment of a full operating force and at the same time grant the men one day off a week.

SECTION OF SHOPS AND YARDS, W. M. BYRNES, ASSISTANT ENGINEER,
IN CHARGE.

The work of this section covers the care of greenhouse and lawns, the manufacture of basin tops, field blacksmith shop, automobile repair shop, paint shop, carpenter shop, and the removal of waste from the sewerage system by water to point of disposal. This section also has charge of the rolling stock, and floating equipment, including marine railway and such stock of material as it is necessary to carry in this division.

In connection with the upkeep of lawns it is believed that a factor in the upbuilding of the morale of the 76 white employees engaged in the vicinity of the sewer division yard at First and O streets SE., would be to build one or more tennis courts for the use of employees. The cost would be very small, and is, it is believed, well worth the investment.

For inclusion in the sewer system, there were constructed under this section 253 catch basin tops with their necessary drip stones and cheek blocks, at a cost of \$10.15 per basin.

The field blacksmith shop made the 78 cup gauges that were installed in the trunk sewers throughout the year, 8 basin cleaning tanks were rebuilt, and 78 wagons, buggies, and other rolling stock were kept in repair as to iron work and 4 autotruck bodies were ironed. All construction tools were kept in condition.

Under the paint shop 41 vehicles were painted, together with all floating equipment, also the 2 portable derricks and 2 watch boxes. All buildings in the yard were painted and many miscellaneous jobs were undertaken.

Under the auto shop hydraulic hoists were installed on two 2½-ton Republic trucks and these trucks placed in service on construction work. At the time of the Knickerbocker Theater disaster this organization was called upon to help remove debris, and, calling upon the United States Motor Corps and the District of Columbia surface division for the loan of trucks and wagons, this division hauled about 84 tons of heavy iron beams and girders and large pieces of concrete and plaster to a near-by dump.

Under the carpenter shop all construction forms, for use in connection with trunk sewers built by day labor, were made. The tugboat was overhauled and 4 scows were repaired. The rolling stock was kept in repair as to carpentry work and new bodies were built for 4 autotrucks and 2 field cars.

In connection with the removal of waste by water, it became necessary to thoroughly overhaul the tugboat at an expenditure of \$1,384.64. This work withdrew this boat from service for 49 days, requiring the discontinuance of sediment chamber cleaning and ash removal. It is believed that from this date it will be more and more difficult to obtain uninterrupted service from this boat and it is felt imperative that sufficient funds should be provided for the purchase or building of an auxiliary tow boat, since in case of a serious breakdown, the

rental of a tug to perform this very necessary work would be in the neighborhood of \$45 a day. In addition to work on the tug it was necessary to repair 4 scows at an expenditure of \$917.15. The scows, 8 in number, are fast deteriorating due to lack of repairs and renewals, and the necessary funds should be provided for establishing a definite policy of rebuilding one scow each year until this floating equipment is in proper condition. The above floating equipment is principally employed in transporting sludge from basin cleaning tanks, sludge from sediment chamber cleanings and ashes from the main sewerage pumping station to the point of disposal. These wastes are deposited as back fill behind the sea wall of the Anacostia River improvement, under permit from the United States Engineers' Office.

At the present time there is at the First Street yard a steam-operated hoist, elevated railway and dumping car installed in 1911 at a cost of something over \$3,000. This equipment is now greatly in need of repair, requiring an expenditure estimated at about \$2,000. This equipment was installed for the purpose of receiving sand, gravel, and brick directly at the sewer division yard. In view of the fact that material can be drawn from the District of Columbia property office yards at a reduction estimated at 15 per cent less than the same material can be supplied through the sewer division yard, it is believed that to repair this equipment is unjustifiable and it is proposed to scrap same, reclaiming any machinery worth while. Rentals received on dredge, marine railway, and pumps amounted to \$577.64 during the year, or more than sufficient to keep same in thorough repair. A much-needed addition to this yard is a tractor for hauling lumber and reinforcing steel and also for transporting portable derricks, concrete mixers, etc., to various construction points throughout the city. Had such a tractor been available at the time of the Knickerbocker Theater collapse it would have rendered excellent service.

Probably the greatest need of this section is appropriate and sufficient housing for the motor vehicles of this division. At the present time the trucks are stored under open sheds exposed to the weather, and during the winter every precaution is necessary to prevent freezing. Plans are now in course of preparation for a garage of light construction which may be enlarged as occasion demands.

SECTION OF UNDERGROUND CONSTRUCTION, PUBLIC SERVICE CORPORATIONS, A. G. DUNN, ASSISTANT ENGINEER, IN CHARGE.

The work assigned this section involves detailed determination of locations for new extensions of gas mains, electric, telephone, and telegraph conduits, with their accessories, as well as supervision of the work done under permits therefor, and the accurate location of all work. Applications for these new constructions require careful location studies so as to avoid interference with existing and future construction, and particularly to assure economical and orderly occupation of public space along predetermined systematic lines. During construction the work is regularly inspected, compliance with the terms of the permit is insisted upon, and an accurate record of the location of all work is obtained from field measurements. Record

sheets are prepared showing the work in detail, and the work is then plotted on record maps and recorded on card system.

The work of the year may be summarized as follows:

Permits prepared upon application.....	2, 643
Gas mains laid.....	miles.. 9. 90
Electric conduit laid.....	do... 10. 10
Telephone conduit laid.....	do... 6. 45
Telegraph conduit laid.....	do... 0. 01
Traction company conduit laid.....	do... 1. 97
Manholes constructed.....	1, 371
Houses connected with gas mains.....	848
Houses connected with electric light and power.....	2, 291

In addition to the current work of the year 11 new record maps were made, thus extending the area mapped for this activity. However there is a great need of a complete set of gas and conduit maps for this section, in that less than half the area is now covered and many of the existing maps are badly worn.

In advance of all proposed surface work, a study is made of existing and needed conduits, and where considered advisable, recommendation is made to the Public Utilities Commission that the respective corporations be required to install same.

Following is a statement of the amounts charged each of the several public service corporations for supervision and inspection on account of underground construction during the fiscal year:

Washington Gas Light Co.....	\$893. 09
Georgetown Gas Light Co.....	205. 68
Potomac Electric Power Co.....	1, 728. 56
Chesapeake & Potomac Telephone Co.....	697. 79
Postal Telegraph Co.....	1. 58
Capital Traction Co.....	274. 58
	<hr/>
	3, 801. 28

By a small change in method of handling applications for permits, it is estimated that an annual saving of about \$400 has been effected.

The greatest need of this section is motor transportation for the section-head, this vehicle also to be used, when occasion demands, by his inspector. For want of this much-needed transportation it is becoming more and more difficult to make the necessary intelligent studies for proper locations.

J. B. GORDON,
Sanitary Engineer.

ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF THE ELECTRICAL ENGINEER.

WASHINGTON, *September 15, 1922.*

SIR: I have the honor to submit the following report of the operations of the electrical department for the fiscal year ended June 30, 1922:

STREET LIGHTING.

The street-lighting system has been maintained and additions and extensions of minor sort to meet pressing demands and needs in newly occupied unlighted streets, etc., have been made about on

the same basis as in the next preceding year, and at some especially necessary points the size of existing lamps has been moderately increased. Of an increase of \$15,000 in appropriation, approximately \$6,000 was not expended for reasons stated below.

The distribution of street lighting throughout the area and the logical relation of parts is believed to be better than in most cities, but the need of a higher degree of illumination and of visibility practically throughout is again cited with an increase of emphasis. Reference is made to report of the electrical engineer for the fiscal year ended June 30, 1920. Instead of being somewhat favored, as might seem to be justified by the character and peculiarities of the city, the grade of street lighting and the expenditure for lighting in Washington are very far below the best and much below an average of cities comparable in population and mileage of streets. Plans and studies are being made of methods of greatly improving the degree, the effectiveness, and the efficiency of lighting at a less increment of cost. This involves both selection and design of some different equipment to supplement the existing and to avoid scrapping the existing. Changes needed but which would probably have conflicted with the contemplated scheme were deferred.

The net increase in number of lamps of all kinds is 366, compared with 342 in 1921. Of the 603 lamps newly connected (gross), 337, or about 56 per cent, were either "designation" lamps or the lowest-powered gas or electric. The increase in aggregate candlepower of the street lighting system is from approximately 1,707,200 to approximately 1,752,100, about 2.6 per cent.

ARC LIGHTING.

This system has been affected by the addition of one 6.6-ampere and three 4-ampere magnetite arc lamps, to a total of 783 arc lamps connected June 30, 1922, as compared with 779 at the close of the preceding year.

One 6.6-ampere arc lamp was moved and one added to improve a detail at southwest corner of Thirteenth and F Streets NW. Two 4-ampere arc lamps were added at and near the corner of Florida Avenue and North Capitol Street, and one on Florida Avenue between Seventh and Eighth Streets NW. for same reason.

INCANDESCENT ELECTRIC LIGHTING.

The number of incandescent lamps added is 320, discontinued 120, a net increase of 200, being 75 of 250 candlepower, 16 of 100 candlepower, and 109 of 60 candlepower; 67 of the 250 candlepower were by change from 60 and from 100 candlepower. The largest new installations were of ten 100-candlepower lamps around Iowa Circle, replacing gas lamps formerly maintained through the Office of Public Buildings and Grounds, eight 100 candlepower in isles of safety in roadway about Scott Circle, and sixteen 60-candlepower, Alaska Avenue, Sixteenth Street to Georgia Avenue. The remainder of increase was by widely scattered installations of five and less.

The total number of electric incandescent lamps connected June 30, 1922, was 8,606, compared with 8,406 at the close of the preceding year.

MANTLE GAS LIGHTING.

The number of mantle gas lamps added was 269, discontinued 116, a net increase of 153. The entire 116 discontinued (60 candlepower) were replaced by 117 (of the gross added, 269) of double-burner, inverted, of 120 candlepower.

The largest new installations were of 17 single burner about the new development of square 3557, Second, Third, Adams, and Bryant Streets NE.; 7 similarly at square 3014, Eighth, Ninth, Buchanan, and Crittenden Streets NW.; and 7 at a highway improvement, North Carolina Avenue, Sixth and Seventh Streets SE., the remainder in single lamps and small groups, widely scattered, including 47 in alleys; no gas lamps were replaced by electric lamps.

The trial change of equipment to double inverted (120 candlepower) at intersections and to single inverted (60 candlepower) intermediate, notably in K Street NW., First to Twenty-second Street; Rhode Island Avenue NW., First to Twelfth Street, and North Capitol Street, Truxton Circle to Michigan Avenue, has proven a notable improvement in effectiveness of lighting, with moderate increase of annual cost.

The total gas-mantle lamps connected June 30, 1922, was 10,734 (10,617 60-candlepower, 117 120-candlepower) compared with 10,581 (all 60-candlepower) at the close of the preceding year.

DESIGNATION LAMPS.

The number of designation lamps added was 10, 4 gas and 6 electric, and the number discontinued was 1 electric, a net increase of 9. The one discontinued was a special equipment traffic warning lamp in base of lamp-post, replaced by a traffic warning fixture of other design, equipped with larger lamp.

The total of designation lamps connected June 30, 1922, was 585 (401 gas, 184 electric) compared with 576 (397 gas, 179 electric) at the close of the preceding year.

TRAFFIC LIGHTS.

Trial installations have been made of a few lights for traffic guidance purposes; at the permanent street-car loading platform in Fourteenth Street NW., between G Street and New York Avenue, (4); at isle of safety intersection Massachusetts and New Jersey Avenues, (1); at isle of safety Sixteenth Street north of Columbia Road, (2); and at northwest side Sheridan Circle, (1); a total of 8, lamp-posts have been specially equipped to design by the electrical engineer, District of Columbia, with colored glass "bull's-eye" lens or lenses (1 to 5) mounted in face or faces of octagonal base of lamp-post, District of Columbia design No. 15, transmitting light from lamp within the base; the post carrying also at top in usual manner a typical lamp; the bull's-eyes are disposed directionally to warn traffic near at hand and that approaching from all legally possible directions; also, at Seventeenth Street and Park Road (1); Sixteenth Street and Columbia Road (1); and in roadway around Scott Circle, (2); a total of 4, special fixtures (commercial product), analagous to the widely used "mushroom" but illuminated by inclosed lamp, have been installed. These are all considered serviceable and of

value in traffic control; type of fixture is not yet standardized, but a growing demand for lighting equipment for this purpose is probable; but with street surfaces lighted to an adequate degree of visibility, the need of such specialty would nearly or quite disappear.

LIGHTING ALONG STEAM RAILROADS.

The situation with respect to the several suits brought by the District of Columbia against certain railroad companies for repayment for sums expended for the lighting of streets, avenues, etc., adjacent to their several rights of way, remains essentially as reported for the past two years. The new trial in the lower court, necessitated by the ruling of the court of appeals, referred to, has not been reached. The sum to be added in claim by the operations of the fiscal year is \$9,395.19.

SIGNAL SYSTEMS.

The fire-alarm telegraph, the police patrol signal, and the telephone systems have been operated and maintained and each has expanded slightly in the line of natural growth.

Fire-alarm boxes added to the system numbered 29 (20 public, 9 "private"), and 4 "private" boxes were discontinued, a net increase of 25, to a total in service June 30, 1922, of 739 (581 public, 158 "private"). Boxes connected by underground wires were increased by 13 to a total of 626, including 503 on street posts, and boxes connected by overhead wires increased by 12 to a total of 113.

The report of the committee on fire prevention of the National Board of Fire Underwriters, on the city of Washington, dated July, 1916, is again cited; as to distribution of fire-alarm boxes, it is therein stated: "In the congested value district, distribution of boxes is good * * *. In other districts distribution is good to poor or lacking. * * *." Among the "most important" recommendations concluding that report was one that additional boxes be installed to secure a certain standard of distribution. While the net increase this past year of 20 public boxes compares with an average annual increase in public boxes of $18\frac{1}{2}$ for the 6 years since the date of that report, the expansion of suburban development in that period leaves the present situation probably somewhat less favorable than in 1916. An increased appropriation for two or three years to overtake the arrears, followed by annual appropriations based on actual need to maintain standard, is earnestly recommended.

The switchboard and instruments for enlarging the fire-alarm headquarters apparatus was received during the year, and was mounted and connected at headquarters by the office staff; the extension of battery rack to receive the necessary increase of storage batteries was delayed by difficulty of securing space, but is in progress; when the rearrangement of the old 30 box circuits into the 40 made possible by this new equipment is completed, the overloading of some circuits, also criticized in underwriters' report, will be remedied.

Each fire-alarm box in service was tested several times in the year (on the average about five times), contacts cleaned and mechanism thoroughly inspected and lubricated or reported for expert attention.

The number of fire alarms received and transmitted through fire-alarm headquarters was 2,033, compared with 1,795 in 1921 and 1,815 in 1920; this includes 36 "additional" alarms (18 second, 9 third, 5 fourth, and 4 fifth) compared with 21 (16 second and 5 third) in the preceeding year. False alarms numbered 181, compared with 145 in preceding year, a relative as well as actual increase, the false box alarms being more than 14 per cent of the total regular box alarms.

The number of police-patrol boxes added was 12 (5 connected underground and 7 overhead), a net increase of 12, compared with 11 in the preceding year, and 1 was changed from overhead to underground connection, bringing the total connected June 30, 1922, to 487; of these, 384 are connected on underground wires and 103 on overhead.

As distinguished from the fire-alarm boxes, which are series connected, in groups of an ideal maximum of 20, on circuits centering at headquarters in District Building, the police-patrol boxes are each served by an individual circuit, those of each precinct centering at its station house, each of which latter having connection to police department switchboard, main 4000, and to main District of Columbia switchboard, main 6000. The police-patrol boxes in the area to be included in the proposed twelfth precinct now center at two or more station houses in existing precincts. With the revival of project, it is recommended that provision be made for the necessary changes in layout of boxes and circuits, to be completed on occupancy of station.

The number of telephones added, connected to the two switchboards in the jurisdiction of this department, was 31 and 10 were discontinued, a net increase of 21, compared with 9 for the preceding year. The number of telephones on District of Columbia system was increased by 26 (compared with 36 of the preceding year) to a total connected June 30, 1922, of 1,453.

The number of cells of storage battery connected on fire-alarm, police-patrol, and local circuits remains unchanged at 2,174.

The distribution equipment for the composite signal system (fire-alarm, police-patrol, and telephone) has been effected by a net increase in underground cables of 2.3 miles of cable, 67.66 miles of conductor; and in aerial cables, of 1.14 miles of cable, 18.2 miles of conductor. Grand total of composite distribution in service June 30, 1922, 6,635 miles of conductor.

This system can not be expanded to meet the demands, by reason of restricted appropriations; but what is more important, continuity of service essential to the safety of the city is endangered.

The value of radiocommunication for municipal functions is being inquired into; contact with outlying offices, with the fire boat and with the police boat, recovery of stolen property, and the apprehension of criminals are already evident points of possible advantage, but no recommendation is submitted at present.

POLES AND OVERHEAD WIRES.

The regulation of the erection of poles, the stringing of overhead wires and of the maintenance of same in safe condition in the streets and other public spaces has been carried on. The operations of the

public-utility companies have resulted in an aggregate net increase during the year of 912 poles (804 line, 108 guy), bringing the record total of all electric poles on June 30, 1922, to 20,914 (19,690 line, 1,224 guy). The list of pole owners comprises the United States, the District of Columbia, and 17 companies (the steam railroads being lumped as one); more than 75 per cent of the poles are owned by, and nearly 99 per cent of the year's increase is by, two of the companies. The increase, 912, compares with 348 of the preceding year. It was a year of exceptional activity due, no doubt, to the exceptional suburban development. The number of telephone poles in streets and avenues within "the prescribed area" of the act of Congress regulating the use of telephone wires in the District of Columbia, approved June 30, 1902, has been increased during the year by 1, identical with the preceding year, notwithstanding. The regulated joint use of poles, in most situations, is favored and, on rare occasions, is imposed; the two most active companies have a working arrangement in that matter which generally brings about the best practical results.

ELECTRIC INSPECTION—WIRES AND APPARATUS.

In the operations under the act of Congress to regulate electrical wiring in the District of Columbia, approved April 26, 1904, and the regulations thereunder:

The total of permits issued for installation of wires and apparatus on private property was 8,029 compared with 6,217 in the preceding year.

Fees paid to the collector of taxes, \$13,861, compared with \$11,626.

Number of inspections recorded, 17,284, compared with 16,170.

These figures not only show increase above preceding year but the number of permits issued, for instance, has increased at the average rate per year for the past three years of $33\frac{1}{3}$ per cent.

To save space, reference is made to report of 1920, in the matter of need of increased personnel for this service, and the statements and recommendations therein repeated with added emphasis. One only needs to recall and consider the Knickerbocker Theater and the Iroquois Theater disasters to appreciate the hazard of the situation. Practically all the pressure on the building inspection division is reflected on the electrical department; yet the wiring permits covered by building permits are only 30 per cent of the total.

MISCELLANEOUS WORK.

The service of this department in cooperation with the municipal architect or for other District departments or divisions, in consulting and counseling, in preparing plans and specifications for and in supervision of electrical work, has been relatively considerable; plans and specifications were prepared, are being prepared, and the introduction of electric work has been supervised where started, in municipal properties: 1 high school; 2 junior high schools; 7 grade schools; 2 special schools; 1 hospital; 1 police station, and 1 market.

PERSONNEL.

Generally earnest and faithful, and in many instances exceptional, service has been rendered by the personnel of the department and I recommend all to your sympathetic consideration.

Very respectfully,

WARREN B. HADLEY,
Electrical Engineer.

To the ASSISTANT TO ENGINEER COMMISSIONER.

Lamps of all kinds in service June 30, 1922, as compared with June 30, 1921.

Kind of lamp.	1921	1922	Kind of lamp.	1921	1922
Mantle gas, single burner.....	10,581	10,617	Electric incandescent—Con.: 100-candlepower, multiple.....	98	98
Mantle gas, double burner.....		117	60-candlepower, series.....	3,917	4,021
Electric arc:			60-candlepower, multiple.....	269	274
6.6-ampere magnetite.....	282	283	Street designation:		
4-ampere magnetite.....	497	500	Gas.....	397	401
Electric incandescent:			Electric.....	179	184
250-candlepower, series.....	14	89			
200-candlepower, multiple.....	64	64	Total.....	20,342	20,708
100-candlepower, series.....	4,044	4,060			

Net increase during year, 366 lamps.

Fire alarms received and transmitted:

Regular box alarms.....	984
Alarms received from telephone stations.....	6
Local alarms.....	1,007
Second alarms.....	18
Third alarms.....	9
Fourth alarms.....	5
Fifth alarms.....	4
Total.....	2,033
False alarms:	
Box.....	139
Local.....	42

Distribution of police patrol boxes, June 30, 1922.

Precinct.	Wall boxes.		Booths.	Total.
	Under-ground.	Over-head.		
First.....	37	1		38
Second.....	28			28
Third.....	50			50
Fourth.....	37	2		39
Fifth.....	44	2		46
Sixth.....	29			29
Seventh.....	23	4		27
Eighth.....	28			28
Ninth.....	38	23	1	62
Tenth.....	52	10	4	66
Eleventh.....	4	35	1	40
Subprecinct, Tennallytown.....	11	21	2	34
Total.....	1,381	98	8	487

¹ Thirteen of these boxes, at following locations, are not on posts: 3, Union Station; 1, engineer stables; 1, Takoma Park, watch box; 1, Treasury Department; 1, Agricultural Department; 1, Department of Justice; 1, Pan-American Union Building; 1, Walter Reed Hospital, information bureau; 3, in special booths erected by the police department at Fourteenth and Kennedy streets NW.; Twenty-second Street and Rhode Island Avenue NE.; and Connecticut Avenue and McKinley Street NW.

Telephones connected to the district system June 30, 1922.

Offices of the District building.....	205
Outside offices and institutions.....	108
Residences.....	4
Public schools.....	245
Fire department.....	58
Police department.....	65
Water department, private branch exchange.....	44
Franklin School, private branch exchange.....	39
Western High School, private branch exchange.....	18
McKinley Manual Training School, private branch exchange.....	18
James Ormond Wilson Normal School, private branch exchange.....	30
Miner Normal School, private branch exchange.....	13
New Central High School, private branch exchange.....	36
Dunbar High School, private branch exchange.....	22
Public Library, private branch exchange.....	22
Washington Asylum and Jail, private branch exchange.....	25
District repair shop, private branch exchange.....	6
House of detention, private branch exchange.....	8
Police patrol service.....	487
Total.....	1,453

There are also 27 portable telephone sets in service, the property of the District of Columbia, used by the fire department and electrical department.

Signals distribution system.

	Cables.	Con- ductor.	Cables.	Con- ductor.
	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Underground:				
Installed, 1922.....	2.365	69.361		
Withdrawn, 1922.....	0.066	1.705		
In service June 30, 1922.....			165.541	6,460.04
Aerial:				
Installed, 1922.....	1.137	18.197		
In service, June 30, 1922.....			5.84	174.81
Total.....			171.381	6,634.85

Electrical wiring inspections.

Notices received from the inspector of buildings of permits indicating electric wiring:

Building.....	1,746
Machinery.....	239
Signs.....	62
Total.....	2,047

Permits issued by the electrical department for installation:

Without fee (ordered by District of Columbia, etc.).....	113
Covered by building permits.....	2,395
Not covered by building permits.....	5,412
For temporary work.....	71
Quarterly (maintenance of plants, etc.).....	38
Total.....	8,029
Temporary use of current.....	437

Total.....	8,466
Certificates issued:	
Final (including 2 without fee).....	5,212

	Number.	Approximate kilowatts.
Lamps and apparatus installed:		
Lamps, incandescent.....	135,541	6,777.00
Lamps, arc.....	7	24.75
Motors.....	427	1,533.00
Devices, miscellaneous.....	206	487.17
Blank outlets.....	169	
Subtotal.....	136,350	8,821.92
Generators.....	3	143.00
Transformers.....	9	825.09
Total.....	136,362	9,789.92

Defective wiring discovered and reported by inspectors, extra of routine inspection work.....	327
Number of notices of defective wiring sent.....	1,874
Requests for inspection (not related to work already under permit).....	12
Miscellaneous jackets (specifications, etc., for District of Columbia work, etc.).....	224
Notices received from the superintendent of licenses, leading to original inspection or periodic (annual) reinspection of theaters, hotels, assembly halls, etc.....	192

Work of inspectors of electric wiring from July 1, 1921, to June 30, 1922:

Inspections in private buildings not including theaters and moving picture theaters).....	16,468
Inspections in municipal buildings.....	166
Inspections in United States Government buildings.....	10
Inspections in theaters (including moving picture theaters) including reinspections, periodic (annual) and occasional, of moving picture theaters (more frequent periodic inspections being made by the fire marshal) and periodic reinspections (weekly or more frequently if bill changes) of theaters.....	690
	17,284

Fees paid to the collector of taxes:

For permits.....	\$13,861
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MISCELLANEOUS WORK.

Completed:

- Johnson School, lighting.
- Public produce market, shed "C," lighting.

Under construction:

- New Eastern High School, lighting, power, telephones, clock and bells, and laboratory equipment.
- Monroe School addition, lighting and power.
- Eaton School addition, lighting and power.
- Wheatley School addition, lighting and power.
- Buchanan School addition, lighting and power.
- Lincoln Park School, lighting and power.
- Psychopathic group, Gallinger Hospital, lighting fixtures.
- Industrial Home School, lighting, power, and heating.

Prepared but work not started:

- Health School, lighting and power.
- Bell School, lighting and power.
- Power plant, Gallinger Hospital, lighting.
- Cell corridors, No. 2 precinct police station, lighting.

In preparation:

- Two typical wards, Gallinger Hospital, lighting, power, telephone and nurses' call.
- Two junior high schools, lighting, power, telephones, clocks and bells.

REPORT OF THE WHARF COMMITTEE.

WASHINGTON, *August 30, 1922.*

SIR: The wharf committee has the honor to submit the following report for the fiscal year ended June 30, 1922:

A list of wharf property under lease on June 30, 1922, and of all wharves used for municipal purposes is on file in this office.

The leases of Joseph P. Stephenson, G. W. Forsberg, and the J. Maury Dove Co. expired during the year, but were not renewed. New leases were entered into with the Maryland, Delaware & Virginia Railroad Co. for the Stephenson Wharf and with James O. Holmes for the Forsberg Wharf. The wharf formerly occupied by the J. Maury Dove Co. is vacant.

It is the policy of the commissioners to fix wharf rentals upon the advice of the assessor as to the value of the property.

The total frontage of wharf property on the city side of the Washington Channel, Potomac River, is 9,275 linear feet, of which slightly over one-half is under Federal jurisdiction. The balance, that is, the frontage between the south curb line of N Street and Thirteenth Street west, is under the control of the Commissioners of the District of Columbia.

That part of the water front under the control of the commissioners is occupied by the municipal fish market and wharves, the morgue, the harbor police precinct, the fireboat wharf, and the workhouse and sand wharves, all of which are municipal activities, and also by lumber and cordwood dealers, marine railways, boathouses, and freight and excursion boat interests.

The waterfront along the Georgetown Channel is under private control, with the exception of the termini of streets, the terminus of Thirty-first Street being leased by the Cranford Paving Co.

Along the Anacostia River front the United States Navy Yard occupies the frontage on the city side from Second to Eleventh Streets. The sewage pumping station and yard occupies the frontage between First and Second Streets. The intake of the Capitol power plant is located at the foot of First Street. The only privately leased frontage is that between the building lines of Q Street SE., which is occupied by the Standard Oil Co.

In the last annual report of the wharf committee attention was called to the deplorable condition of the water front along the Washington Channel. During the past fiscal year very favorable progress was made in the elimination of unsightly sheds and buildings which have been such an eyesore from East Potomac Park. Fifteen structures in all were removed.

When the leases of Joseph P. Stephenson, G. W. Forsberg, and the J. Maury Dove Co. expired, steps were immediately taken to demolish all buildings on the sites. At the Stephenson Wharf all buildings except the warehouse were removed. This warehouse has since been repaired and painted. At the Forsberg Wharf the unsightly piles of scrap iron, boilers, old machinery, etc., were removed and all buildings demolished, while at the Dove Wharf the stable, storage building, office building, and other structures were demolished and the débris hauled away.

In addition to the above, several unsightly sheds which stood at Bennett's shipyard and which marred the appearance of the fish market from the street front, were torn down, as well as an office building formerly occupied by the Roberts Lumber Co.

The destruction of these unsightly buildings has improved to some degree the general appearance of the water front, and with the subsequent removal of other buildings as existing leases expire, it is believed that conditions will continue to improve.

Our grateful acknowledgments are due Mr. William J. Fay, superintendent of the District of Columbia Home for the Aged and Infirm, for supervising the work of removing these buildings. Handicapped as we were by lack of funds, it was possible, with Mr. Fay's assistance, to have the work performed by employees of that institution.

The commissioners adopted the suggestion of the wharf committee that Wharf No. 6, now in the course of construction, be turned over to the harbor precinct upon completion, so that the ramshackle buildings which now house that precinct, and which are a disgrace to the city, may be demolished.

The motor truck has displaced the river steamer to a great extent in the transportation of vegetables, fruits, and other commodities from the tidewater counties of Maryland and Virginia. At the present time there are three freight steamers in the river transportation business, but the steamboat companies report that they could handle more business if it were not for the motor truck.

The United States Engineer Office reports an increase of \$1,000,000 in the value of materials shipped into Washington by water during the calendar year 1921.

While we can not predict what the future needs of commerce will be, it is believed that the present is the logical time to give consideration and study to the adoption of a plan for the general improvement of the entire water front of the Washington Channel, with a view to providing maximum facilities for all legitimate water front uses, both governmental and commercial. The first step in this direction should be the establishment of a bulkhead wall. The Board of Engineers of Rivers and Harbors has this matter under advisement.

When the District of Columbia was zoned in 1920, certain areas along the Georgetown Channel and along the Anacostia and Potomac Rivers were set aside for industrial and commercial purposes. The water front of the Washington Channel was not, however, zoned to permit industrial or commercial activities, the commissioners' idea relative thereto being to permit definitely only such business as existed prior to the adoption of zoning, and to decide future uses as the need arose. In this connection it is believed that the use of the water front along Water Street SW. should be more or less restricted because of East Potomac Park on the opposite side, and that no new enterprises should be encouraged which would tend to mar or detract from the appearance of Potomac Park.

A careful record of the dates on which fire insurance policies expire has been kept, and the necessary steps taken to have policies renewed upon expiration.

With the exception of two or three wharves, surveys were made by the surveyor, at the request of the wharf committee, of all wharf property on the water front along the Washington Channel under municipal control.

ROLAND M. BRENNAN,
Chairman.

D. E. McCOMB,
RUSSELL DEAN,

Wharf Committee, District of Columbia.

To the ENGINEER COMMISSIONER.

REPORT OF THE BOARD FOR THE CONDEMNATION OF INSANITARY BUILDINGS.

WASHINGTON, September 15, 1922.

GENTLEMEN: We have the honor to submit the following report for the year ended June 30, 1922. Buildings on which action was taken in response to notices served under the act creating the Board for the Condemnation of Insanitary Buildings during the year ended June 30, 1922.

REPORT FOR YEAR ENDED JUNE 30, 1922.

	Exam- ined.	Demol- ished.	Repaired.	No action war- ranted.	Value of repairs.	Pending.
Buildings in streets.....	248	62	74	98	\$43,430	14
Buildings in alleys.....	86	22	24	34	3,000	6
Buildings condemned under sec. 16, Build- ing Code:						
Buildings in streets.....	44	28	14			2
Buildings in alleys.....	25	20	5			0
Total.....	403	132	117	132	46,430	22

SINCE BOARD WAS CREATED.

Buildings in streets.....	3,905	1,779	1,356	578	\$185,265	.....
Buildings in alleys.....	4,516	898	673	2,861	29,355	.....
Total.....	8,421	2,677	2,029	3,439	214,620	.....

Number of board meetings held during the year ended June 30, 1922.....	18
Number of preliminary notices served during the year ended June 30, 1922...	134
Number of condemnation notices served during the year ended June 30, 1922...	40
Number of condemnation cards affixed to buildings during the year ended June 30, 1922.....	49
Number of condemnation notices served under section 16 of the Building Code during the year ended June 30, 1922.....	69
Inspection and miscellaneous visits.....	1,459
Estimated number of people required to secure other living quarters.....	528
Number of cases in court.....	1
Estimated number of tenants and occupants of dilapidated and insanitary buildings benefited by repairs during the year ended June 30, 1922.....	585
Estimated number of tenants and occupants of insanitary and dilapidated buildings benefited by repairs since the creation of the board.....	7,421

The alley housing situation is improving each year owing to the elimination of the alley dwellings by the removal of the old, dilapidated, and insanitary frame dwellings and the conversion of brick dwellings into garages and warehouses. There were 117 alley dwellings repaired and converted from living quarters to garages and warehouses during the year ended June 30, 1922, by action of the board, and the use of many more alley dwellings was changed during the year through permits issued by the inspector of buildings.

The act of Congress approved September 25, 1914, declaring the use or occupation of any building or other structure erected or placed on or along any alley as a dwelling or residence or place of abode by any person or persons is injurious to life, to public health, morals, safety, and welfare of the District of Columbia; and such use or occupation of any such building or other structure on, from, and after the 1st day of July, 1918, shall be unlawful, was amended by an act of Congress

approved May 23, 1918, which amendment provides: "That the operation of the second paragraph of section 1 (relating to the use or occupation of alley buildings as dwellings) * * * in the same hereby is postponed until the expiration of one year following the date of the proclamation by the President of the exchange of the ratifications of the treaty of peace between the United States and the Imperial German Government. * * *"

That the operation of the second paragraph of section 1, relating to the use or occupation of alley buildings as dwellings, of the act of Congress approved September 25, 1914, entitled "An act to provide, in the interest of public health, comfort, morals, and safety, for the discontinuance of the use as dwellings of buildings situated in the alleys in the District of Columbia," be, and the same hereby is, postponed until June 1, 1923.

Passed the Senate August 24, 1922.

CAREY H. BROWN,
Major, Corps of Engineers, U. S. Army,
Assistant to Engineer Commissioner, District of Columbia.

W. C. FOWLER, M. D.,
Health Officer, District of Columbia.

JOHN P. HEALY,
Inspector of Buildings, District of Columbia,
Board for the Condemnation of Insanitary Buildings,
District of Columbia.

To the COMMISSIONERS OF THE DISTRICT OF COLUMBIA.

REPORT OF THE SUPERINTENDENT OF THE DISTRICT BUILDING.

WASHINGTON, D. C., *August 17, 1922.*

SIR: I herewith submit my report on the care of the District Building, including the operation of the power plant, woodwork and paint shops, print and blue-print shops, elevator, watch, and cleaning forces, and the electrical department, for the fiscal year ended June 30, 1922.

There have been numerous changes during the year; congested conditions in many departments necessitated the interchanging of several offices, including those of Commissioner Rudolph, Major Beson, the sewer department, board of children's guardians, public utilities and trees and parkings; these changes made necessary the building of partitions, repainting of walls, refinishing of floors, etc. The exterior sills and frames of all window openings were repainted.

Eight thousand dollars were expended for repairs to the roof of the District Building. Price quoted by several contractors was approximately \$30,000; with only \$8,000 available it was necessary that we make the repairs instead of having the work done by contract.

The tile and the cement in which they were laid were taken up from about two-thirds of the roof; the tarred paper was thoroughly cleaned, and where necessary was patched by mopping new paper over the old, this surface was then covered with plastic cement, the base of which is asphalt, not pitch, the tile was then relaid in this. Joints were washed with Portland cement, and expansion joints placed each 30 feet. The appropriation being insufficient for relay-

ing the entire roof, all remaining cracks were patched and treated in like manner.

POWER PLANT.

This department made repairs to the boiler room, engine room, and to the plumbing throughout the building as follows:

There was installed an extra heavy blow down pipe line from each of the four boilers to the blow-off sump and this line recovered with new iron floor plates. One 5-inch nipple was put in high-pressure steam line, four safety water gauges were installed, a new water line was put into feed pumps and to stoker backs, painted all water lines with asphaltum paint. One complete set of governor pins was put in No. 3 engine. We also installed eight new flush valves.

There were consumed 2,003 tons of coal compared with 2,155 tons the preceding year, percentage of ash was 13.1 as compared with 15.9 last year.

The pneumatic-tube system was in operation 2,180 hours, heating system 5,038 hours, ventilating system 1,190 hours, live steam 633 hours, and the refrigeration 244 hours.

There were generated 444,430 kilowatt hours, of this there were used for lighting 294,150, for elevators 53,950, and for motors throughout the building 96,330 kilowatt hours.

ELECTRICAL DEPARTMENT.

The electrical department in addition to its routine work changed 32 direct lighting fixtures to semidirect, installed 6 desk lamps, changed the lighting system in room 104 to meet the requirements of the municipal architect.

There was installed on No. 1 passenger elevator a new electric door switch, and on No. 3 elevator a new mechanical door lock, four armatures have been repaired. The routine work in this department consists of repairs to electric fans, connecting adding machines, replacing lamps, plugs, etc.: in addition to this the elevators and the elevator signal system require the constant attention of one man. Electric current used by the various departments for other than lighting was as follows:

	Kilowatt hours.
Police department.....	3, 245
Health department.....	34, 005
Electrical department.....	672
Fire-alarm headquarters.....	5, 791

WOODWORK AND PAINT SHOPS.

This department has kept in repair all windows, doors, locks, window shades, Venetian blinds, minor repairs to furniture throughout the building, repainted walls, and refinished floors.

PRINT SHOP.

This department did a large portion of the printing required by the various departments of the District Building. There were printed 1,400,569 pieces of printed matter, including pads, calendars, stitching, stapling, cutting, etc., at a total cost of \$6,639.02.

BLUE-PRINT AND PHOTOGRAPH SHOP.

The building of the Eastern High School and additions to many other schools and buildings increased the work of this department considerably. In spite of the fact that our price for blue printing was this year reduced from 4 to 3 cents per square foot, there was an increase of \$4,785.15 as compared with receipts of last year.

A drier for the Pease blue-printing machine was purchased at a cost of \$600, thereby greatly facilitating the work of this department. There were completed 183,608 square feet of blue printing and 2,550 photographs, lantern slides, maps, etc., at a total cost of \$8,103.22.

I again call attention to the necessity of either building an addition to the District Building or acquiring additional property for the housing of some of the departments. Since the erection of the building, 14 years ago, all floor space has been utilized for the relief of congestion caused by newly created departments and the growth of the original ones. Rooms have been constructed in corridors and under stairways; partitions have been built in offices; and at least two departments are dividing their working forces into a. m. and p. m. shifts because of insufficient floor space for the conduct of their business.

F. S. BESSON,
Major, Corps of Engineers, United States Army,
Superintendent.

The COMMISSIONERS OF THE DISTRICT OF COLUMBIA
(Through the Engineer Commissioner).

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